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Vol. XV APRIL, 1920 No. 4

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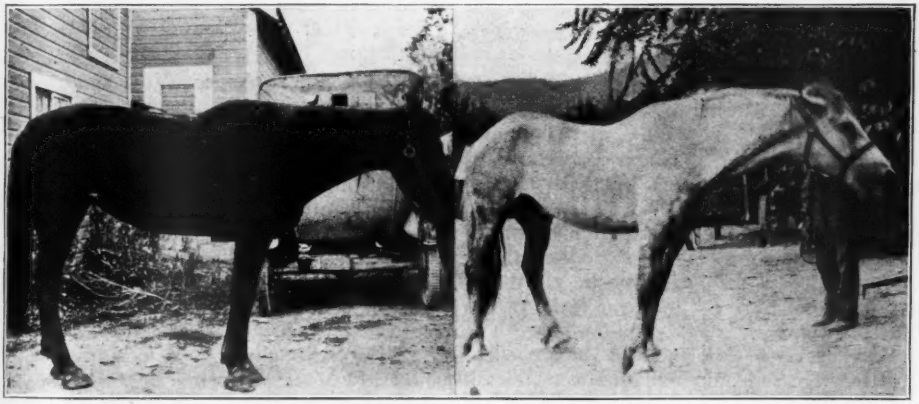
Orchard Horse Disease

By J. W. KALKUS, Pullman, Wash.
Head of Division of Veterinary Science, State College of Washington Agricultural Experiment Station

THE writer recently had an opportunity of making an investigation of a disease which has been causing considerable loss among horses in certain sections of Washington. The condition occurs in enzootic form in the irrigated apple orchard districts. It is little known prior to the last three years. Since that time it has gradually increased to an alarming extent. It is now claimed by many that it is practically impossible to keep a horse for any great length of time on an irrigated orchard tract, where orchard-grown hay is fed, without the



Typical cases of orchard horse disease. Note the distressed look on the face of the horse at the right. He showed these symptoms after having been trotted about twenty-five yards.

designated locally by various names as, orchard horse disease; orchard poisoning; alfalfad horses; arsenate of lead poisoning; mold poisoning; whistlers; roarers; thick-winded horses, etc.

So far as can be learned from veterinarians and stockmen in districts where the condition occurs, the disease was animal contracting the disease. The number of cases of this malady have materially increased in the past year in certain localities.

Arsenate of Lead Theory

Present knowledge indicates this disease is confined to the irrigated apple orchard districts where fruit is grown

on a commercial basis, and where it is the common practice to use arsenate of lead in spraying fruit trees. In the majority of orchards, alfalfa is grown as a cover crop between the trees. During the spraying operation much of the spray material drops onto the alfalfa, and as rains are frequent, adheres to the foliage. The leaves of the growing alfalfa show a decided gray color, from the deposit of arsenate of lead after an orchard has been sprayed. It is stated on good authority that especially during the past year this spraying practice has been somewhat overdone. The concentration of the arsenate of lead has been greater and the number of applications increased.

It is common practice to allow horses to graze in orchards and to feed orchard hay as well. This has led to the assumption by both orchardists and veterinarians that orchard horse disease is due to arsenate of lead poisoning. Owing to the fact, however, that the symptoms of this disease do not resemble arsenic or lead poisoning in every particular, many veterinarians are inclined to doubt the arsenate of lead theory. Some are of the opinion that the condition is due to mold poisoning; the symptoms, however, are not typical of this trouble.

This is by no means the first time that lead arsenate spray has been suspected as a possible source of danger to domestic animals. (1) O'Kane, Hadley and Osgood report a number of experiments in which arsenate of lead was fed in various ways to guinea pigs, calves and sheep. They were able to produce similar symptoms of poisoning in all these animals whenever the drug was given in sufficient quantities. (2) Paige reports similar experimental work with cattle. He fed varying amounts of lead arsenate to five stall fed cows, all of which died following symptoms of violent purgation, in some cases accompanied by paralysis. (3) Kirkland reports a single experiment with a horse weighing 1,200 to 1,300 pounds. "Sufficient grass to make two large feedings for a horse was cut and spread beneath a pear tree of medium size, and the tree heavily sprayed with arsenate of lead, at the rate of 20 pounds to 150 gallons of water. The drippings from the tree were not sufficient to discolor the grass to any marked degree, so the nozzle was turned on the grass, thoroughly drenching it. The grass . . . was fed to the horse during the afternoon and evening. . . . . Two days later the horse 'was well and hearty, and in better condition than before the grass had been fed to him.'"

So far as the writer has been able to learn no other experiments of a similar nature have been conducted with horses. Nor has there been reported in veterinary literature a disease among horses corresponding in symptoms to the so-called "orchard horse disease."

A great deal has been written regarding the effect of smelter fumes upon live stock, and the symptoms of arsenic poisoning in this connection are so well known that it is not necessary to go into a discussion of the matter here. The condition has been studied from various angles by (4) Formad; (5) Harkins and Swain; (6) Haywood and others. All available literature on this subject has been carefully consulted but the writer has been unable to find a similarity between this condition and orchard horse disease either in symptoms or postmortem lesions.

Clinical Aspect Varies

The clinical aspect of orchard horse disease varies somewhat in different animals, probably due to a difference in susceptibility. Or as one veterinarian, who is firmly convinced that the trouble is due to arsenate of lead poisoning, suggests that, "As lead and arsenic are contained in the spray material it is highly possible that an idiosyncrasy exists, some individuals being susceptible to lead and acquiring the chronic form and others showing an acute form due to arsenic." In general the symptoms are either acute or chronic.

In the acute form the disease manifests itself suddenly and resembles very much a typical case of respiratory influenza. One veterinarian says, "All of the cases I have seen first impress the owner with the idea that his horse has distemper, perhaps because distemper is the most common respiratory disease of this section." There is usually an elevation of temperature varying from 102 to 104.5°

F. In the majority of cases, however, the temperature does not rise higher than 103° F. The pulse is accelerated, 60 to 80 beats per minute, regular but weak and sometimes thready. Respirations are correspondingly increased, 12 to 20 per minute.

Some animals show, a few hours prior to these initial symptoms, marked indications of abdominal pain. This is evidenced by pawing, lying down, and sometimes rolling, but this is usually of short duration. In all cases there is loss of appetite and the horse becomes dull and listless. Invariably the animal coughs. The visible mucous membranes may at first show a decided congestion sometimes accompanied by watering of the eyes. Later there may be decided icterus or paleness of the mucous membranes. In most instances there is a mucous or greenish colored discharge from the nostrils. The discoloration is apparently due to admixture of food, the result of paralysis of the pharynx. When drinking, much of the water returns through the nose. Affected animals rapidly lose flesh, become emaciated, and the coat becomes rough and starring. Decided weakness is manifested by disinclination to move and unsteadiness when walking. The trouble is frequently complicated by pneumonic changes, and in such instances there is always a foul odor from the breath, due no doubt to foreign material making its way into the trachea as a result of pharyngeal paralysis.

The majority of acute cases die after six or seven days' illness. One veterinarian reports that in the final stages, that is, during the last few days before death, the animal salivates intermittently and an accumulation of white foamy material is seen about the mouth.

A few of the less severe cases make a partial recovery, but it usually terminates in the chronic form after an illness of three weeks or more.

Although the above describes the average acute case, it is quite evident from careful inquiry that all animals show slight abnormality some weeks previous to the first noticeable symptoms. The history of the case usually shows that an animal has not been doing well for several weeks. He loses flesh in spite of an abundance of feed, sweats more than usual, and tires easily after slight exertion.

A chronic case of orchard horse disease. When at rest the animal appears normal. The picture at the left was taken after the horse had been trotted about a hundred yards. The mouth is opened in an effort to get air. After being trotted for several minutes, the animal fell in a fit of "choking." After resting a few minutes, he breathed with greater ease. After resting five minutes, he regained his feet and appeared normal again.

About 50 per cent of all cases of orchard horse disease, according to the records of one veterinarian, are of the chronic type.

Horses affected with the chronic form of the disease are usually in good physical condition and when at rest appear normal. When such animals are exercised they show symptoms of difficult breathing during inspiration, accompanied by a roaring sound. This condition is due to a paralysis of the vocal cords, and varies in intensity in different animals. In most cases the condition is so severe that it is impossible to trot or walk an affected animal for any great distance without causing it distress. Working such a patient is practically out of the question. The writer has observed a

number of cases in which inspiration became very difficult after trotting twenty-five yards. If such an animal is urged to greater exertion it opens its mouth in an effort to get more air. Its nostrils

"Horse plague" as it occurred in the Arkansas Valley in Colorado in the summer of 1919, described on page 494 of the October, 1919, issue.—Photos by Dr. A. T. Kinsley. Note the similarity in appearance to cases of orchard horse disease, shown in this article.

become dilated; it shakes and tosses its head, striking with the front feet and swaying from side to side in an effort to remain standing. There is a loud wheezing sound with each inspiration, profuse sweating, a distressed expression, and marked cyanosis of the mucous membranes. Eventually the animal becomes so weak and unsteady that it falls to the ground. This seems to bring relief and in a few minutes the roaring ceases. After a short rest the animal is able to regain its feet and is again apparently normal. Not all affected horses show the condition in this exaggerated form. Some are only slightly affected and can be used for light work. It is even stated by some that all horses used in orchard work sooner or later develop a so-called "thick wind."

Some chronic cases are apparently a sequel to the acute form of the disease while others develop so gradually as to escape notice until roaring is noted. Some cases show a slight nasal mucous discharge and a chronic cough which may persist for months. This condition is especially prevalent in the early stages, but may later disappear.

Prognosis Grave

The prognosis in all acute cases is very grave. No authentic cases of complete recovery have been reported. Affected horses which do not succumb in the acute stage, gradually get better, and after a duration of three to six weeks the disease assumes the chronic form accompanied by roaring.

Animals affected with the chronic form of this trouble if untreated may live from several months to a year, depending on the severity of the case. They are valueless as work animals, as even slight exertion causes them to "choke down." The majority gradually emaciate, become weak and finally die. About 25 per cent die in a choking attack induced by work or hard driving. Sometimes even slight exertion in the pasture from walking or play will cause a violent attack of choking and result fatally.

Postmortem Findings

The writer is just beginning the investigation of this trouble and up to the present time has autopsied only one chronic case. A number of postmortem findings have, however, been reported to him by veterinarians in the field.

The principal lesions in the acute cases, as reported, consist of acute inflammation of the pharynx and larynx, pneumonia

and pleurisy. The mucous membranes of the nasal passages, except for icterus or paleness, are normal. All other organs seem free from inflammatory disturbances.

In the one chronic case autopsied by the writer the chief lesion was paralysis of the left vocal cord and marked atrophy of the muscles controlling it. The liver showed a few attached shreds of fibrin on the surface; the spleen showed a sprinkling of petechial hemorrhages; a few small subserous hemorrhages were present on the heart over the left ventricle near the apex. There was no evidence of inflammatory disturbance in the respiratory tract and all visceral organs were apparently normal. This animal had never shown acute symptoms and had shown the roaring symptoms only about two weeks prior to the time that he was killed for autopsy.

Medicinal Treatment of Little Value

Medicinal treatment seems to be of little value. Nux vomica and potassium iodid have been administered for varying periods of time with no apparent beneficial results. Some believe that if affected animals are taken off of orchard hay and turned onto wild pasture for several months many will recover. This is doubtful, for while such animals may appear to be in good physical condition and in apparent health, they are usually roarers, and hence have not completely recovered.

Drs. R. E. Baker and C. P. Fay, of Wenatchee, Washington, who have had a great deal of experience with this malady, report good results following the Williams operation for roaring in chronic cases. They have operated upon some one hundred or more cases in the past three years. The operation is advocated only for animals which are in good physical condition and in apparent health except for roaring. Discharge from the nose or a cough contra-indicate operation. In all cases a bilateral operation is performed in the usual manner. About 80 per cent of the subjects operated upon in this way become serviceably sound. About half of this number make a perfect recovery. The other half usually show slight difficulty in breathing after excessive exertion; this may be due to faulty healing at the point of operation or to complications following tracheotomy. The remaining 20 per cent usually develop a "thick wind," either immediately after operation or within a few months, gradually becoming worse until destruction of the patient is necessary.

Coma preceding the end in "horse plague."

Experimental Work Now Under Way

Owing to the economic importance of orchard horse disease, which is causing serious loss in the state of Washington, a series of experiments are now being conducted at the Washington Agricultural Experiment Station with a view of determining its cause and nature. It is hoped that some definite results will be obtained in the near future.

Acknowledgments

The writer desires at this time to express his appreciation to Drs. R. E. Baker and C. P. Fay of Wenatchee, and Dr. V. C. Paulhman of Prosser, Washington, for some of the information embodied in this article and for assistance rendered during a preliminary investigation of orchard horse disease.

References.

1. Arsenical residues after spraying. Bull. 183. New Hampshire Agric. Exp. Sta. June, 1917.

2. The effect on cows of continued administration of small doses of arsenic. Also the effect of single and repeated doses of arsenic. Mass. Agr. Sta. 21st Rept., Part II, pp. 183, Jan., 1909.

3. Experiments with a horse fed on grass sprayed with arsenate of lead. 45th Ann. Rept. Mass. Bd. of Agr., p. 390, 1897.
4. The effect of smelter fumes upon the live stock industry in the Northwest. U. S. D. A., B. A. I., Rept., 1908, pp. 237-268.
5. Study of the causes of poisoning of live stock adjacent to smelters. Jour. Am. Chem. Soc., Vol. 30, No. 6, pp. 928-946, June, 1908.
6. Study of ill effects caused by smelter fumes. Jour. Am. Chem. Soc., Vol. 29, No. 7, pp. 998, July, 1907. Injury to vegetation and animal life by smelter wastes. U. S. D. A., Bur. of Chem. Bull. No. 113, 1908.

Flavine and Its Uses in Veterinary Practice*

By DR. C. A. ZELL, Chicago, Illinois

THE remarkable discoveries of Erlich years ago, have practically revolutionized the art of medicine along many lines. Before his classical investigations the medical profession was dependent upon remedies derived from nature to combat disease. Erlich's long years of experimentation and untiring efforts showed that a more definite and more certain method could be developed to fight the infectious diseases—the chemical method.

His investigations showed that certain chemicals killed microorganisms *in vitro*. This formed the basis of a new hope to kill microorganisms in the blood stream by injection of these chemicals. Here, however, great difficulties were discovered. Robert Koch attempted to inject bichlorid of mercury intravenously into experimental animals suffering from anthrax. The maximum dose, however, was not sufficient to kill the bacteria but killed the animals instead. The problem then was to find a pure chemical compound which would kill the bacteria without harmful effects to the animal. Chemotherapy, the science based on the specific action of certain chemicals on microorganisms is the latest creation of master scientists, and shows great promise in the curative treatment of diseases which have baffled the medical profession for many years. Let us take for example in the human line, the treatment of syphilis with salvarsan. Erlich found a definite chemical—a complex organic arsenic compound, which when injected into the blood stream killed the syphilitic organisms and thus cured the disease. This preparation is popularly known as "606." The name arising from the fact that Erlich had to make 606 different arsenic compounds and purify each one before he found the one that was most effective against syphilitic infection. It took him twenty-five years to complete this great work. This indicates the vast amount of work required to find such a chemical curative. Once found, however, it is the greatest triumph that the profession can desire.

The cure is a sure one because the chemical and the microorganisms unite and render the bacteria powerless. A simple example of these chemical affinities is the combining of erythrocites with oxygen and carrying it through the blood stream. Erlich calls these remarkable affinities "chemoceptors."

Other chemical compounds which Erlich found to have the properties of rendering certain microorganisms ineffective, are known as acridine-dyes. They are derivatives of a constituent of coal tar. Among the thirteen acridine-dyes, there are only two, the acriflavine or diamino-methyl-acridine-chloride and the proflavine or diamino-acridine-sulphate, which are of use to the medical profession. These are the only ones which when injected into the blood stream do not destroy the white blood-cells and are not hindered in their bactericidal action by the presence of serum. This is contrary to the action of any antiseptic chemical used heretofore.

Relative Toxicity of Acriflavine and Proflavine

Browning and Gulbransen conducted some very interesting experiments on the determination of the relative toxicity of acriflavine and proflavine, and of the bactericidal power which I mention in the following:

Its toxicity for mice was determined by injecting watery solutions subcutaneously, the dose being so arranged that a 20-gram mouse received a volume of 1 cc. The

*Read at the 37th annual meeting of Illinois Veterinary Medical Association, Chicago, Dec., 1919.

findings were that the maximum-non-lethal dose for a normal 20-gram mouse with acriflavine was six-tenths of a milligram; for proflavine, three milligrams.

The bactericidal power of acriflavine and proflavine was found by adding the antiseptics to cultures of Staphylococcus aureus and B. Coli at 37 incubated 24-48 hours and subcultures made after this time. The results were as follows:

(0.7 per cent peptone water and undiluted serum were used as media.)

1. Staphylococcus aureus. In peptone water a solution of 1:20,000 of both flavines killed all the microorganisms.

2. B. Coli in peptone water was killed by a solution of 1:4,000 of proflavine and by a solution of 1:1300 of acriflavine; while in serum a solution of 1:100,000 of both flavines was sufficient to kill the microorganisms.

Substance:	Maximum Non-lethal dose for a normal 20 gramm mouse	Bactericidal Concentration For			
		Staphylococcus Aureus in		B. Coli in	
		0.7% Pepton Water	Serum	0.7% Pepton Water	Serum
Proflavine	0.006 Grm.	1: 20.000	1: 200.000	1: 4000	1: 100.000
Acriflavine	0.0006 Grm.	1: 20.000	1: 200.000	1: 1300	1: 100.000

This experiment shows that the potency of these antiseptics is considerably increased by the presence of serum, which action differs remarkably from all other antiseptics.

Introduction of Flavine Into Blood Stream

Another group of interesting experiments relates to the introduction of flavine into the blood stream of experimental animals and subsequent testing of the serum for bactericidal action. Browning and Gulbranson injected rabbits with flavine in normal salt solution, a dose of .066 grams per kilogram body weight. Then they bled the animals at various intervals after injection, and inoculated the serum with Staphylococcus aureus and B. Coli. Serum from blood taken before flavine injection showed a heavy growth of bacteria, while that taken fifteen minutes after injection gave no growth. Subcultures on agar showed no growth, proving that the bacteria had not only been inhibited but actually killed. The writer repeated these experiments with some modifications, and found it possible to dilute the flavine containing serum with that taken before flavine injection to the extent of 50 per cent without interfering with the bactericidal action of the chemical. It was also found that upon treating the original serum which had no flavine, with enough of the chemical to make a 1:100,000 dilution, the combination killed Staphylococcus aureus and B. Coli.

These experiments show very plainly the quick and perfect bactericidal action of flavine in the blood serum, even to the period of two hours after inoculation. It follows therefore that repeated intravenous injections of flavine will render the blood bacteria free.

It is furthermore to be noted that the exceptionally low toxicity of these dyes together with their increased potency in serum, proves their superiority over all other antiseptics heretofore used.

Wound Treatment

In human patients, suppurating and non-suppurating wounds have been successfully treated with flavine. This has all been very recently worked out and the results are quite remarkable. For suppurating wounds, flavine at a solution of 1:1,000 is used. Preliminary surgical preparations are made to have the wound open and drainage free. The wound is then swabbed out with flavine once or twice a day, carefully, so that every deep point and crevice is reached. Shreds, sloughs, etc. are removed. Then the wound is lightly packed with gauze saturated in flavine solution 1:1,000, and covered to avoid evaporation. The wound can be fairly flooded with flavine, as the presence of several ounces in the cavity is absolutely safe. Where the wound shows spreading inflammation, it has been found that the injection of flavine in the affected area gives good results. The flavine is dissolved in normal saline solution, so the injection involves no complication in the wound secretion. This entire procedure can be conducted so that the wound is packed once in twenty-four hours, thus giving a great advantage over other antiseptics which require frequent changes.

It has been found that with a contam-

inated wound, flavine treatment if given within the first few hours, causes healing by first intention. This is really a prophylactic use of flavine before the onset of suppuration.

Combination Best for Veterinary Usage

Bearing these facts in mind and observing the really remarkable action of the flavines in human cases which had come to my attention I thought at once of their use in veterinary practice. I studied the bactericidal value of the two dyes in the laboratory against streptococcus, staphylococcus, B. coli of various sources, suisepticus, bovisepticus, etc. Both dyes showed a powerful killing action against all common pathogenic organisms tried, but proflavine seemed superior to acriflavine against certain organisms, while on the other hand acriflavine had some advantages against others.

Considering that most infections involve more than one organism, the practical solution of the problem was to use a preparation containing both dyes. This special flavine solution I used exclusively in further experiments.

As to my own field experiments, I wish to mention a number of cases of suppurating wounds in horses and dogs, in which a happy result was obtained with flavine treatment. Cases of poll-evil, wither's, fistula, and quittors of long standing, yielded very nicely to the flavine method.

In fistula especially, flavine is indicated, for the reason that one can pack the fistulous channel with gauze saturated with a flavine solution. The wound then heals from the inside, and there is no danger of the opening becoming closed and leaving unhealed interior parts.

A veterinarian in the east, to whom I recommended my procedure with flavine a few months ago, called it the best prepared antiseptic ever used in his entire practice. He says, "It is almost 100 per cent perfect. Wounds, abscesses, fistulas, and open joints of knees are so readily healed that only a few injections are necessary."

This man has an extensive horse practice in New York and has given the flavine method a fair trial—others have reported just as favorably.

There is no doubt as to the great value of flavine in the treatment of wounds of all kinds. Aside from the wound treatment, there are many other possibilities in the treatment of general septicemia—and pyemia, with its intravenous application.

Since the reports of Browning and Gulbranson, who have used the flavine in numerous cases of septicemia in man following gunshot wounds, and have had excellent results, it occurred to me that we as veterinarians could perhaps apply this method in the treatment of septicemia in animals. I thought particularly of hemorrhagic septicemia, and conducted a number of experiments along this line, which showed me that the flavine treatment has a very marked effect on the bacteria of the Pasteurella group. A solution of 1:100,000 of flavine added to a bouillon culture of the bipolar organism was sufficient to kill all growth in a short time. The same experiment was carried out with some other bacteria of animal infections such as bronchisepticus, different streptococci, and a number of anaerobes. All yielded to the antiseptic very promptly. The field cases which I had the opportunity to experiment on gave correspondingly good results. Here the special flavine solution was applied intravenously at a dilution of 1:1000 in normal salt in a dose of four to five ounces. This injection was repeated every day until three doses had been given. The animals showed marked improvement immediately after the first injection and upon completing the treatment 81 per cent recovered, in a total of eighteen cases. While the cases in which this treatment has been tried thus far are few in number, nevertheless the results are promising and have encouraged me to continue the investigation.

Further very encouraging results were developed by a prominent Chicago practitioner who tried my flavine solution against purpura hemorrhagica. Of two cases which were treated successfully, one was in an advanced condition. The foul nasal discharges, necrotic lung, swellings all over the body, etc., showed the condition to be serious. After a number of large intravenous doses of the flavine the case showed improvement and cleared up in good shape.

These surprising results were encouraging enough to merit further trials, so the next experiment was on pleural pneumonia. Of two typical similar cases one animal was given six ounces of the flavine solution intravenously, and the other treated

by the older methods. The first animal recovered in a short time while the other died. Of course, the number of cases tried is small, but naturally with an entirely new veterinary treatment we must make such a beginning. The results are more than promising.

The advantages of the flavine treatment as shown by the Browning and Gulbranson experiments in the human line, and by my own investigation in the veterinary field are summarized as follows:

1. Flavine is a very powerful antiseptic for the common pathogenic organisms.

2. The presence of serum instead of hindering the power of this antiseptic does the opposite—it increases the potency. When applied in wound treatment where the presence of serous exudate cannot be avoided it differs from all other antiseptics known to medicine at the present time.

3. In serum, for example, its bactericidal power for staphylococcus aureus is 800 times that of dichloramine-T, and 20 times that of corrosive sublimate.

4. Solutions of very high bactericidal power (1:1000) are innocuous when applied directly to the tissues and do not exert deleterious action on the highly important part played by the phagocytes and on wound repair. With the antiseptics in common use the concentration necessary to kill microorganisms is also sufficient to terminate all effective phagocytosis, while in the case of flavine, phagocytosis proceeds actively even in a concentration 200 times greater than is necessary to kill the bacteria.

5. Several ounces of a 1:1000 special solution of the antiseptic may be injected into the blood stream and muscles without producing ill effects either local or general.

6. I believe even at this stage of my experiments that flavine is *the* antiseptic for veterinary use. Its low toxicity and high bactericidal value are not the only great advantages; it also simplifies the technic of wound treatment.

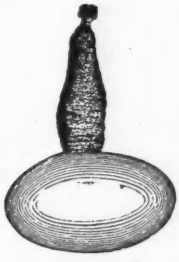
7. I do not claim that this flavine treatment which I am introducing will in any sense be a substitute for biologics, but used simultaneously with biologics it should be an ideal method.

Principal Parasites of Swine*

By T. A. SIGLER, Greencastle, Indiana

IT is not the intention of the writer to present anything new, but only to review some of the notes and papers already given on parasitic diseases of swine to provoke discussion. As the busy practitioner's time was formerly devoted largely to the treatment of infectious diseases in swine, parasites infecting food-producing animals were given little attention until the value placed on these animals began to soar, and the study of other diseases has thrown light on the subject and brought parasitology into its own, and it is now considered quite possible and probable that some of the bowel, lung trouble, thumps, etc., are due to parasites. The habits of the hog afford greater opportunity for infection than of any other animal. When given the range of the average corn belt farm, the old clover field, the manure pile, the same old feed lot year after year where corn cobs are piled up and the eggs protected from desiccation, pigs come in contact with all form of parasitic life in the larval or immature form.

The Hematopinus suis, or common hog louse, is the external parasite most frequently found in swine. It is a blood-sucking parasite and the largest of the



Pork measle worm with protruded scolex, slightly enlarged. (After Ostertag.)

*Read at 37th annual meeting, Illinois Vet. Med. Assn., Chicago, Dec., 1919.

Ascaris suum. (From Kinsley's "Swine Diseases.")

Gigantiorhynchus Hirudinaceus. (From Kinsley's "Swine Diseases.")

species of the blood-sucking family of lice. The female when grown is about one-fourth inch long.

Phthiriasis, or lousiness, is the common parasitic condition of swine. A very common source of infestation is stock from infected herds. Filthy tumble-down hog houses, old sheds and straw stacks used for quarters for hogs, when once infested with lice are prolific centers of infection. When a large number of lice are present on a hog they cause a great amount of irritation and consequent injurious results. The animal becomes restless, does not feed well, and growth and thriftiness are interfered with. Pigs suffer more than older animals because of their thin skins. The coat becomes thin and the hair is entirely lacking in spots; the skin is soiled and more or less covered with scales and sores, opening up new avenues for other infection.

Treatment. The habits of the hog and the difficulty in destroying the larvae scattered about hog houses make it a difficult task to free a herd from lice. Kerosene emulsion is usually applied with a spray pump or sprinkling can or by dips in warm weather. In cold weather a powder composed of pyrethrum and naphthalene is dusted on the pigs' backs and on their bedding. After treatment the pigs should be moved to fresh quarters. The pens and houses should be sprayed and all litter burned.

The Entozoa

Of these parasites infesting the internal organs, the ones which the practitioner most frequently comes in contact with are the lung worm, the round worm, whip worm, thorn head and kidney worm.

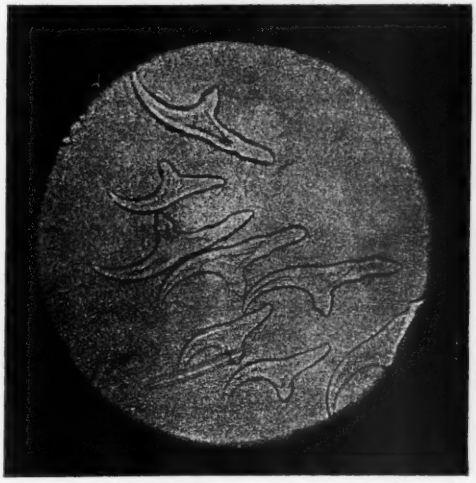
Acaris Suilla or Lumbicoides

This is the common round worm of the intestine. It resembles the earth worm in shape and color. During life it is of a pinkish gray color with a glistening surface. After death it loses its pinkish tint and becomes more opaque. The female is ten to twelve inches in length, the male six to seven inches. It was formerly believed that when only a few worms were present no serious results would occur, but it is not the intestinal form that causes serious trouble except when they occur in large numbers in the intestines, causing obstruction. The lung form is the form now regarded as the cause of serious trouble. The embryos are young worms migrating to the lungs. The newly hatched worms migrate from the intestine into the circulation, go to the liver and lung, up the trachea and down the esophagus back to the intestines. It has also been found that the eggs must be incubated outside of the animal's body before the life cycle is completed. For this information we are indebted to Ransom, Stewart and Foster.

Treatment—Santonin and Sanitation

Too often these conditions are treated without ordering a rotation of pig lots. Pigs can no more be grown on the same lots year after year without the place becoming infested by animal parasites than can plant life. We know the raising of tobacco, corn, and cotton on the same land year after year will not only deplete the soil but the soil will become infested with phyto parasites, deadly to the particular plant grown. Investigation of the life cycle shows that in certain stages of development of the embryo it may live outside the body for months or even years.

Strongylus paradoxus, or lung worm of the hog, is a small thread like worm, brownish or dirty white in color, from an inch to one and a half inches in length. They are ovoviviparous. Recent investigations of the life history of the lung worm show that the eggs are extruded into the air passages of the lung with mucus and are swallowed. The eggs hatch while passing through the alimentary canal and



Single hooks of a dangerous measle worm, greatly enlarged. (After Ostertag.)

the embryos leave the animal's body. The embryos when deposited where conditions and temperature are favorable molt and develop protective sheaths in eight to ten

Section of a measly hog heart.—Ostertag.

days. In this stage they are remarkably resistant to cold and dryness.

Symptoms Obscure

The symptoms are often obscure. Unthriftiness, anemia and emaciation are shown, especially in young pigs, and if associated with paroxysmal cough at first hard and later moist and rattling and it occurs in a large proportion of the herd, independently of any climatic change, damp beds or other causes of lung trouble, the diagnosis may be confirmed by the finding of the adult worm in the frothy expectoration.

Treatment

Inhalation, tracheal injections. Treatment is satisfactory except in a few cases. Prevention is to be sought in a change of pig pens and range.

Echinorhynchus Gigas or Thorn Head

This is a round worm about two-thirds the caliber of a lead pencil, with transverse markings, milk white in color. The head is globe shape, provided with six rows of hooks. The posterior half of the female attenuated, female eight to ten inches, male three to four inches in length. Life cycle. The eggs are passed out on the ground, embryos are injected by the white grub worm, larvae of the may bug, which is the intermediate host. Hogs become infested by eating the grub. Conditions produced by anchorage of the cephalic extremity to the intestine pushing out the serous coat. A nodule is produced resembling a tubercle. When infested by large numbers, it proves fatal to pigs, causing convulsions and derangement of the digestion. The treatment is the same as for ascarids.

The Trichocephalus Crenatus or Whip Worm

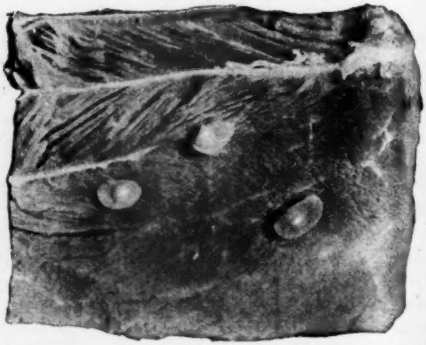
In shape it resembles a blacksnake whip. The posterior part of the body is about the caliber of a thread. The anterior two-thirds is attenuated finer than a hair. The worm measures from one and one-fourth to one and one-half inches. They are found firmly attached to the mucous membrane. When only a few are present no serious results occur. When present in large numbers diarrhea and an unthrifty condition result.

Stephanurus Dentatum or Kidney Worm

It is found especially in southern hogs. The body is slightly larger than a knitting needle. Both caudal and cephal extremities are blunt. It frequents the subiumbar regions, producing small abscesses. It is also sometimes found in the kidney.

Esophagostoma Dentatum

This is a small white or grayish white worm, one-third to three-fourths of an inch in length, and is found in the cecum and colon. When present in great numbers, they produce irregularities in digestion, diarrhea and finally death. The treatment is the same as for the ascaris.



Musculature of hog with measle worms appearing on the cut surface.

Practical Practices for the Practitioner*

By W. H. WELCH, Lexington, Illinois

IT is an old saying that "Necessity is the mother of invention." Oft-times, in crises, our ingenuities are taxed to the utmost to cope with some existing condition that demands immediate action. We meet the emergency successfully, and it is not unlikely, that should we ever again face a similar problem, we will handle the situation in the same manner.

I am bringing to your attention some practices which I have adopted, that have served me well under such circumstances, and have become a fixed mode of procedure with me. Some of them may appeal to you as bordering on the empirical, but I have no apology to offer for presenting them. They have produced results in my hands; there is no patent on them, and you are free to adopt them or not as you may desire.

A Splint That "Stays Where It Is Put"

Some years ago, I was consulted concerning a yearling Jersey heifer that had sustained a fracture of the tibia about eight inches above the hock. I informed the owner that nothing could be done, and advised consigning her to the butcher's block. After interviewing the butcher, who offered but $15.00 for her, the owner returned and insisted that I go out and see if it was not possible to do something for her. He seemed much more confident of my ability to successfully cope with the situation than I, myself, and even after making a careful examination, it was with great reluctance that I attempted treatment.

After racking my brain to devise some method of applying either a cast or splints that would offer some assurance of being held in position, I shaped two splints from the staves of a nail keg, soaked them in water to prevent splitting and to render them somewhat more pliable, and drove them full of long carpet tacks. After wrapping the leg well with cotton, the smooth surfaces of these splints were applied, and bandaged on as tightly as possible, the ends of the tacks reaching well through the bandages. I was somewhat surprised, but much pleased the following morning to learn that the splints were still in place as I had adjusted them, and favorable reports continued to reach me daily. At the end of a week, I made a second visit, and rebandaged the fracture, which was all the attention it received until the splints were removed at the end of six weeks, a perfect recovery resulting.

This venture led me to try the plan a few times since, and the results have fully convinced me that numerous fractures sustained above both hocks and knees, can many times be thus successfully treated, even in our larger animals. With smaller animals, by using this idea, it is possible to practically immobilize any limb in almost any position desired. In addition to the above animal, I can exhibit as perfect recoveries, a radius fractured at its inferior third, in a three-day old calf; the humerus of a dog; but most important of all, a fractured humerus in a three-months old pure-bred Percheron filly. Perhaps a description of the method of application in this last case may be of interest. One short, wide splint, driven full of tacks, was adjusted to the inside of the leg, reaching from the knee to the body. An elm stave splint from a salt barrel was similarly treated, and adjusted to the outside of the leg, from the knee to the top of the back, just posterior to the withers. After firmly bandaging the splints around the leg, the upper part of the outside splint was firmly bandaged to the body, thus holding the humerus fairly immobile. It was necessary to readjust this splint several times, but at the end of two months the patient was walking very well indeed, and in three months she was trotting, absolutely sound.

In adjusting splints of this character, it will be found advantageous to use a wider bandage than usual, a four-inch bandage being preferable. Also in some cases, I believe that a light plaster paris cast, applied below the knee or the hock, might be made to serve as a support for the splints above, and be of material assistance.

I sincerely hope the next time you have an opportunity, that you will attempt this plan of treatment, and not summarily dismiss the owner with the statement that nohing can be done. At least, try it. While I realize that the percentage of re-

*Read at 37th Annual Meeting, Illinois V. M. A., Chicago, Dec., 1919.

coveries can be nowhere near as great as in fractures below the knee or hock, yet I am convinced that it will often help to save valuable animals for the breeding ranks, if not for the active field of usefulness.

A Home-Made Uterine Pessary

Shortly after graduation, I had my first experience with an everted uterus. After replacing the organ, the cow continued to strain violently. She was placed in a narrow stall, the hind parts elevated, and a deep suture taken in the vulva. I had no more than reached the buggy when the owner came running exclaiming that the uterus had again reverted. I once more succeeded in replacing the organ, and while I was holding it in position by retaining my arm in the vagina, I happened to spy, hanging on the wall, a nose twitch, about fifteen inches in length, made from a broken spade handle. I directed the man who was with me, to scrape off its entire surface, wash it in an antiseptic solution, and then bind about one-third of a pound of absorbent cotton over the end, using a soft twine string. It was then thoroughly saturated with carbolized oil, and inserted into the vagina, the end approximating the os. The cow's tail was then drawn through the handle of the pessary, a rope tied in its end, and carried forward between the hind legs, a half hitch being taken around the body in front of the udder, and another one just behind the front legs, thence forward between the front legs, attaching the end to the halter. Additional ropes were then attached to the handle, starting on each side of the tail, thence forward to each rope encircling the body, and finally attached to the halter. This effectually prevented the pessary from being forced out of position by the tail sliding down.

Since this homely home-made pessary served me so well in this case, I have continued using this method as a safeguard against a recurrence in every case of everted uterus. It is left in place from six to twelve hours, and after the first hour, the animal seems to experience no discomfort. She can readily defecate and urinate with it in position, and as it places the pressure well back, just where it is needed, the uterus cannot even start to evert again, and the relaxed ligaments soon regain their former tonicity.

An Improved Operation for Umbilical Hernia

This operation combines the good qualities of both the clamp and elastic ligature methods. After a twenty-four-hour fast, the animal is placed on its back, the hernia reduced, and a clamp securely applied as high up as possible. A stitch is taken below the clamp at each end, and tied to it to prevent the clamp from slipping down. An elastic ligature in the shape of two or more three-quarter inch rubber bands, each being doubled or trebled between the clamp and the body, are applied, and allowed to slough off, which they do in seven to ten days. An immunizing dose of tetanus antitoxin is administered and no further attention is required. I use an ordinary wooden clamp, five to seven inches in length, as its loss is of no consequence. To those who, like myself, do not possess clamp forceps with which to tighten clamps, I will state that the ecraseur applied around the end of a clamp, holds it securely while the end is being tied, and answers all requirements. The three-quarter inch rubber bands may also be cut from sections of discarded inner tubes, although a more elastic rubber band is preferable.

A Home-Made Set of Slings

A most efficient and economically constructed set of slings may be made from a bunch of discarded engine belting from a threshing machine. These belts vary in size from five to eight inches. Those from six to eight inches are preferable for supporting the body, while the five-inch size is suitable for the breast collar and breeching. Have your blacksmith weld eight D-rings of five-inch size. The ends are sawed from two new singletrees, making them the length desired, which varies from 24 to 32 inches. Cut the large size belting for encircling the body, into seven-foot lengths, their number depending on the width you desire the slings. The ends are wrapped around the singletrees and securely bolted with one-quarter-inch bolts. About 16 to 18 inches below the singletrees, run your cross belts of 5-inch width belting with D-rings in each end to which the D-rings in the breast collar and breeching are to be attached. The five-inch belting for the breast collar should be three feet long, allowing for the ends to be turned through the D-rings and securely bolted, or riveted. The breeching should

be cut 3.5 feet long for the same reason. Your harness maker can readily arrange leather stays or buckles for adjusting the breast collar and breeching.

This when completed makes a very strong and durable sling, and as one can often buy sufficient engine belting for a dollar or so, the entire sling should cost not to exceed six or seven dollars, exclusive of the block and tackle.

A Special Use for the Wornout Collar-Pad

Who has not felt compassion for the poor horse, suffering from colic or azoturia, that has rolled and tumbled in great agony for hours, as he views the poor brute's bruised and battered up head. These sloughing patches can be avoided largely by providing adequate protection for these parts, and no better means can be devised than by making use of the common discarded collar-pad, which may be found in almost every barn. The pad is adjusted around the head, and firmly attached at three or four points to the headstall of the halter. A browband is attached to the halter to prevent it slipping back too far. This makes an excellent protector that will effectually prevent the animal from doing serious damage to his head.

A Cheap and Efficient Uterine Capsule

Several years ago I was called to treat a cow which had calved a few days previous. She had refused to eat that morning, had a characteristic odor, soiled tail, and had considerable temperature. Vaginal exploration disclosed the os tightly closed with a portion of the placenta hanging through it. As it seemed impossible to dilate the os sufficiently to get the hand through, I removed what could be drawn throngh the os, intending to insert a uterine capsule, but upon investigation, I discovered I had none with me. After flushing out the vagina, I inserted into the uterus a number-10 capsule filled with boracic acid. I had small hopes of the cow living, and after leaving internal treatment to be administered, I told the owner that I would return thirty-six hours later and repeat the treatment. Imagine my surprise, therefore, on the morning I was to make my visit, to receive a telephone message that the cow had shown improvement from the first and seemed about well again, and that it would be unnecessary for me to come. Since that time I have discarded the use of commercial uterine capsules, and have used none but those containing plain boracic acid. I believe them to be very efficient, besides possessing the added quality of cheapness.

The Passing of the Catheter

By this title I do not desire to indicate that I have discovered any new methods, or more approved plan of introducing the catheter into the bladder, but that, I, like many other practitioners, have ceased to use it for that purpose. You are all familiar with the process of withdrawing urine from the mare by dilating the neck of the bladder. The bladder of the gelding may be as effectually emptied by massaging that organ through the walls of the rectum. It is by no means a difficult process, and with very little practice one may become quite proficient in this procedure. This method, however, does not seem to be in as general use among the practitioners as it should be. Personally, I believe, I have not passed a catheter in six or seven years. There is nothing, in my opinion, quite so disagreeable as the odor acquired in the passing of the catheter. Aside from this, this method eliminates injuries to the urethra and the carrying of infection into the bladder.

I still, however, have an important use for the catheter. In retained meconium in the young foal, with the catheter attached to the end of the hose of an injection pump, it is usually possible to get beyond the obstructing mass, and materially assist in rendering it soft and more easily passed. By forcing water ahead of the catheter, one can work it well forward into the rectum without the slightest danger of damage to the rather delicate walls of that organ.

The Ring Twitch

For many years, I have discarded the nose twitch attached to a long or short handle, and feel that I have thus saved myself many raps on the side of the head, due to the animal jerking his nose away during the process of attaching it. I also wish to call attention to a special manner of applying the ring twitch, which adds materially to its effectiveness. The twitch is applied to the nose very tightly; the halter rope is passed through the ring, then back under the throat-strap of the halter, and once more down through the ring in such a manner that with every

move the animal makes, he automatically tightens the twitch on his nose. This twitch possesses special advantages for the country practitioner who is often called upon to cast wild colts that have not previously been broken to lead; with it he can lead them to any location, without fear of them getting away.

These methods may not appeal to you in the least, as your own plan of procedure may be vastly superior to mine. However, as we fraternize with our professional brethren in the discussion of different topics, oftentimes an interchange of ideas proves mutually helpful. It is with this purpose in view, therefore, that I have brought to you the above homely suggestions, trusting that at each of our succeeding meetings others may be induced to present similar papers disclosing their pet methods of dealing with various phases of practice.

Report of Committee on Infectious Abortion

By WARD GILTNER, E. S. BAYARD, G. M. POTTER, E. C. SCHROEDER and T. H. FERGUSON

AT the last annual meeting of the association your committee presented a report which was referred to it for further consideration. Such further consideration as was implied in the act of the association has been given the report, and your committee has made a very earnest effort to determine upon a course of action against Bang's abortion disease that will meet with the approval of the entire association.

We, therefore, recommend that the association go on record as endorsing the following statement as constituting its position in the matter of the so-called bovine epizootic abortion disease, being guided only by confirmed, or virtually confirmed, facts and some of the conclusions to which they point.

While it cannot be doubted that all abortions among cattle are not due to the Bang bacillus of infectious abortion, as is specifically shown by the investigations of Stockmen and M'Fadyean and those published by Theobald Smith last December in the Journal of Medical Research under the title of "Spirilla in Infectious Abortion of Cattle?" there seems to be no satisfactory reason to doubt that the great, widespread important plague which we have named, "infectious or contagious abortion disease of cattle," has, as its primary, essential, specific cause, the Bang bacillus of infectious abortion.

This statement does not seek to deny the possible occurrence of numerous other affections in which the reproductive organs of cattle may be involved, and which may be either independent affections or sequelae to the disease produced by the Bang bacillus or by the Spirillum described by Smith. It means merely that the great plague which bears the name abortion is the most impressive and most widely recognized, manifest symptom, is due to a definite, well known microorganism, and that this organism is the Bang bacillus.

Udder Common Habitat of Bang Bacillus

The most common habitat of the Bang bacillus appears to be the udders of infected cows, in which it may persist for months or years. The nature of the pathological process in the udder is unknown, but is indicated by (Cooledge) an increased cellular content of the milk. It appears that this statement is equivalent to saying that in Bang's bovine abortion disease healthy carriers are very numerous. The full significance of this statement as regards the spread of the disease among domesticated animals cannot be estimated at the present time, although the work of Huddleston indicates that calves are not infected by drinking raw milk from such udders, and the work of Good should warn against such milk in the diet of pregnant cows. As regards human infection the work of Cooledge and others fails to indicate any danger from this source.

It has been shown (Schroeder and Cotton) when abortion bacilli are present in

*Presented at 23rd annual meeting of the U. S. Live Stock San. Assn., Chicago, Dec., 1920.

the udder, that they may reach the gravid uterus, and, irrespective of whether the cow calves normally or abnormally, whether she carries her calf to full term or expels an immature fetus, that, immediately before and at the time of parturition and shortly after, she may expel abortion bacilli via the vagina.

These facts indicate that one of the very important things we should do in our efforts to check the spread of abortion disease, is to discover and, if possible, control the movements of the seemingly healthy carriers and disseminators of the infection.

Cows that actually abort, or have retained placentae, or have a discharge from the genital passage, easily attract the attention of their owners. The owners of such cows should be taught how much harm such animals may do if they are introduced into abortion-free herds, and should be instructed never to sell them without giving their purchaser a true statement regarding their condition. Owners of abortion-free cattle should be cautioned against the purchase of such cattle, and should be instructed regarding the apparently healthy carriers of infection.

If it is found, after proper instructions, through circulars and bulletins issued by various official establishments, such as the offices of state veterinarians, state experiment stations and departments of agriculture, the Federal Bureau of Animal Industry, etc., that abortion-infected cattle are misrepresented at the time they are offered for sale, it is recommended that laws, with severe penalties, to check this evil, be enacted by state legislatures.

Since our knowledge of so-called infectious disease does not justify us in recommending far-reaching radical measures that would impose severe and expensive restrictions on the movements of live stock, we conclude that it is sufficient to justify the enactment and enforcement of laws against the misrepresentation of abortion-infected cattle that are sold for other purposes than immediate slaughter.

Complement-Fixation and Agglutination Tests Endorsed

We endorse the complement-fixation and agglutination tests for Bang's disease as reliable means of determining the presence or absence of infections in a herd when used by competent individuals, but we are not yet able to interpret fully the reactions in so far as the individual animal is concerned, although light is being thrown on this matter by the researches of a number (Fitch et al., Smillie et al.). These tests, especially the agglutination test, the simpler of the two, should be used more widely to protect abortion-free herds against abortion-infected cattle. The suspensions of abortion bacilli and the samples of blood needed to make the agglutination test, can be kept without deterioration for fairly long periods of time; hence, there is no reason why state veterinarians, state experiment stations and agricultural colleges, should not at all times be in readiness to make abortion-disease agglutination tests, and no veterinarian who is a creditable member of his profession should find it difficult to draw samples of blood from cattle, that will be sufficiently clean and sterile to make it possible to ship them from any portion of any state to any other portion, or, for that matter, from any portion of the United States to any other portion, in a much shorter time than will be required for such samples to become unfit for use in abortion agglutination tests.

Wherever such tests can be made by state or other officials or in state or other official establishments, for a small or a nominal fee, or preferably, free of charge, cattle owners should be instructed in various ways, which we do not believe it necessary to attempt to elaborate, that abortion-free herds need the aid of such tests to keep them free from abortion disease in the same manner that tuberculosis-free herds need from tuberculin test to keep them free from tuberculosis. However, these tests should not be used to the exclusion of other methods valuable in the determination of a diagnosis of the disease.

Regarding the significance of the bull as an agent for spreading abortion infection, though no unimpeachable evidence has been obtained to prove that the bull infects cows at the time of copulation, it would be foolhardy to take liberties with infected bulls, bulls from infected herds, or promiscuously used bulls, because there are other possible ways in which an infected bull may infect the cows with

which he comes into contact than through the act of copulation.

Precautionary Methods Important

The two only definitely proved channels through which abortion bacilli are expelled from the bodies of infected cows are the udder and the genital tract, through the former often continuously for long periods of time and through the latter intermittently and for relatively short periods of time. Hence, whatever other precautions are taken, the greatest care should be used to prevent contact between materials from the udders or genital tracts of actually or possibly abortion-infected cows and susceptible cattle. For this reason the use, when they can be provided, of special maternity stables for cows, is recommended, and it is strongly urged that extreme precautions be taken against the dissemination of infection through the agency of skim milk, whey, etc., returned to the farm from creameries, cheese factories, etc. To this end, we recommend the universal pasteurization of dairy by-products distributed from the factory to the farm. Regarding the treatment of the various conditions associated with or sequent to so-called infectious abortion disease, like retained placentae, temporary or permanent sterility, inflammation of the uterus, etc., it should be generally recognized that they require careful treatment, such as they can receive only at the hands of intelligent, thoroughly trained veterinarians. There is no doubt but that the proper treatment of actual cases of abortion disease, of the sequelae of the disease, and of the pathological conditions due to secondary invaders, or microorganisms which seem to establish themselves in tissues devitalized by the pathological processes of abortion disease, will greatly reduce the number of abortions the number of cases of sterility and other factors of loss.

Prominent among the things that can be done, in the light of our present knowledge, to check abortion disease, is the education of the owners of live stock. They should be taught in every possible way that it pays to fight this plague vigorously; that we are gradually acquiring the knowledge on which the economical direction of the fight depends; that it is only through cooperation between all those persons who are interested in the conservation of food-producing animals that rapid progress toward the desired goal can be made, and that, though our knowledge remains far from complete, there are many things we can do without fear of wasting our time and substance, and with the assurance that our efforts will be richly rewarded; whereas failure to act on the basis of present knowledge will be fatal and tantamount to criminal negligence.

BOOK REVIEWS

La Fourbure In Cheval
(Founder of the Horse)

By R. Straubard, Veterinarian of the Belgian Field Army. Two hundred and sixteen pages. Profusely illustrated with color plates and photographic illustrations, all original. Jouve & Company, Paris.

The book is an exposition of an exhaustive research on all phases of the disease, presenting entirely new ideas and well proven theories which explode the traditional interpretations of the old authors. The author shows in the preface that since Xenophon's work, *"Traite de l'Equitation,"* little has been added to its clinical history, and that modern authors have differed only slightly in minor details as to the character of the disease. In proving that the old ideas are erroneous, the book opens up a field for an entirely new line of thought regarding horse founder. The work was ready for publication at the time of the opening of hostilities in 1914, but as the events of the time prevented, the author as assistant veterinarian in the Belgian Remount Depot at Calais, was able to make additional observations and research which add greatly to the force of his arguments.

The assistance of the eminent anatomist, Professor Bourdelle of Alfort, in the preparation of the chapter on anatomy assures the readers a real treat on the anatomy of the foot, and the color plates from copies made at the museum of Alfort bring out some details on the circulation of the foot that have not previously appeared in print.

Chapter II is devoted to the study of "Differential Regulation of the Blood-pressure in the Arteries of the Foot," under which head a regulating apparatus not

(Continued on Page 170)

AMERICAN JOURNAL of VETERINARY MEDICINE

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Subscription Price $4 May 1st

IN an editorial on "The price of the JOURNAL," published in the December issue and to which readers are referred, the following statement was made: "The subscription price of $3.00 is inadequate and has been for some time. An increase is inevitable. It should take place January 1st, but announcement has been delayed because of conditions that might make a price set now insufficient, in a very short time, to maintain the JOURNAL."

It was hoped when this was written that the price of paper, printing and engraving might be stabilized soon to such an extent as to permit a publisher to forecast some months ahead what his magazine was going to cost him, but it has not. The only certain information obtainable has been an increase in cost each month and the prospect that the upward trend will continue for an indefinite time.

In an endeavor to meet this problem of rising costs temporarily until something definite could be learned as to what the cost of publishing the JOURNAL is going to be, we have been forced to do some things that we did not like to do; we have reduced the number of reading pages; we have mailed the JOURNAL folded in wrappers instead of flat in envelopes; (a saving of more than $500 a year); we have economized somewhat on illustrations and in other ways. This is not satisfactory to us and we feel it is not satisfactory to our readers, although no complaint has been made. It is useless to endeavor to "stave off" an increase in the subscription price any longer. Now, the size of the JOURNAL has been brought back to 144 pages and beginning the first of next month, the subscription price will be $4.00 a year.

The increase of $1.00 a year is inadequate to cover even recent increases in the cost of publication; but we still hope, although it seems futile to do so, that some of the items that go into the cost of publication may be lowered in the near future. There is some prospect that the zone postal law, which will ultimately increase the postage on periodicals about 500 per cent and which was a war-time measure, may be amended to lighten that burden. If there should be a general reduction in prices and it should include the cost of paper, printing and the labor that goes into the manufacture of the JOURNAL, we shall reduce the subscription price to $3.00 just as soon as such reduction is justified; but if, as appears a good deal more probable, there should be a further increase in the cost of publication, a further increase of $1.00 a year, making the subscription price $5.00 a year, cannot be postponed longer than a few months.

The subscription price of the JOURNAL has never been set at what we believed it to be worth to subscribers, or at what we thought subscribers would be willing to pay for it, but always as low as the JOURNAL could be produced and the quality maintained. This makes inevitable an increase in the subscription price, with a rise in the cost of manufacture, in spite of every economy that it is possible to institute in the publication of the JOURNAL.

The cost of your professional journals

is a necessary part of your expense in conducting a practice. When this cost is increased your clients must reimburse you in higher fees, just as certainly and just as rightfully as they must make up in higher fees for the increase in the cost of drugs and gasoline, and automobiles, and labor and all else that goes into the necessary expense of conducting an up-to-date veterinary practice. Some veterinary associations have already taken steps to raise the fees for veterinary services, notably one in Ohio, and in many cities fees for medical services have been advanced from $3.00 to $5.00 a visit.

Further, there are few of our subscribers that do not have the opportunity to get more for their money out of the JOURNAL at $4.00 than they have been getting at the old price, by making a greater use of its contents. The JOURNAL should be read and reread. No mind can assimilate the whole contents of the JOURNAL at a single reading. The material it contains is too varied and too voluminous. Then, there is the opportunity for discussion of the topics presented. Questions and divergent views on articles, case reports or opinions published almost always bring out further information. Too few avail themselves of this opportunity for additional information on the subjects discussed in the JOURNAL. The service of the Queries & Answers Department might be used more with advantage to many.

The Department of Laboratory Diagnosis that will be started next month, at a conservative estimate, should be worth a hundred dollars a year to each subscriber who makes full use of it. And so one might proceed through the JOURNAL. The value is there; many times four dollars' worth of it. Whether or not you get it, lies with you and you alone.

Free Laboratory Diagnosis for Subscribers

AS an extension of our service to subscribers, we have arranged to give them the benefit of a laboratory examination in any of their cases that they care to send to us.

This service is not intended to supplant nor interfere in any way with commercial diagnostic laboratories which are much needed by the veterinary profession, and are and have been rendering a valuable service to the profession, for which they are fully entitled to the fees ordinarily charged. Our free laboratory examination is not intended to supply a service for which the veterinarian's client should pay. It is intended to help the veterinarian—to give him the benefit of laboratory findings in cases that have puzzled him, to the end that he may become more astute as a diagnostician and more competent as a veterinarian.

For example, it is an acknowledged fact that the best diagnosticians among veterinarians are those who hold the greatest number of autopsies on patients that die in their charge, and that the more autopsies a veterinarian holds on his own cases, the shrewder he becomes in matters of diagnosis. It is notorious that veterinarians seldom receive pay for holding an autopsy on a patient. Laboratory findings mean almost everything in some postmortem examinations and a great deal in many of them. Heretofore, if a veterinarian wished to receive the full benefit from his postmortem examinations in addition to the time that the autopsy required, he was called upon for an outlay from his own pocket for the laboratory findings. Our free laboratory service will be greatly appreciated in such cases, and we hope, and it is for this reason that we have inaugurated it, that it will be the means of inducing thousands of veterinarians to avail themselves more frequently of this refinement of veterinary practice, and as a consequence render better service to their clients and improve the reputation of the profession and the esteem in which it is held by the public.

The foregoing is simply illustrative of what we hope to attain by our department of Laboratory Diagnosis. This service is not restricted to postmortem examinations, but will include all specimens that subscribers care to send us.

In order that our free laboratory examination may serve in its proper field; that it may not intrude upon the legitimate field of commercial diagnostic laboratories and that it may not be overwhelmed

with an avalanche of material that should go elsewhere, the following regulations are laid down for the observance of those who use our laboratory service. They must be strictly adhered to until further notice.

Regulation No. 1: The history of the case must be complete. If the material is from a sudden outbreak in a herd, all known facts concerning its incidence, cause, number and age of animals affected, symptoms, post-mortem lesions, if autopsies have been held, and all other information bearing on the case, discovered by the practitioner or learned from the attendants should be given. If the material is from a case that the veterinarian has treated, a complete report of the case should be given, including history, symptoms, treatment, results, etc.

Accounts of all laboratory examinations will be published in the JOURNAL, and the foregoing information is necessary to make them of value to those who have not seen the case. Our laboratory service, will, of course be beneficial chiefly to those who send in the material, but nevertheless it is designed to be of benefit to *all* subscribers, and for this purpose, must necessarily include a complete clinical picture along with the laboratory findings. The names of those sending material, will not be published except with permission of the sender.

Regulation No. 2: The results of all laboratory examinations will be published in the Journal as promptly as circumstances permit. Where the one sending in the material desires to know the results of the laboratory diagnosis immediately, by mail or telegram, the usual charge for the laboratory examination will be made by the laboratory, and should be paid direct to the laboratory and not to the Journal.

Regulation No. 3: All specimens of plants, silage, forage or other feeds known to be, or suspected of being poisonous to animals, should be sent direct to Prof. L. H. Pammel, Iowa State College, Ames, Iowa, together with a full report of the case, as outlined in Regulation No. 1.

Regulation No. 4: All material from swine, together with a full report as required by Regulation No. 1, should be sent direct to Dr. A. T. Kinsley, New Centre Building, Kansas City, Mo.

Regulation No. 5: All other material, together with reports, should be sent direct to the Journal office.

Regulation No. 6: All material must be sent prepaid.

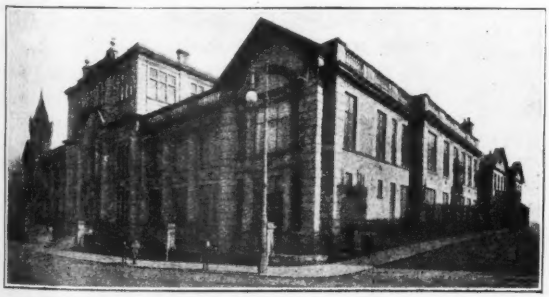
Directions for Packing Specimens for Laboratory Examination

1. Specimens of plants for identification should consist of a considerable portion of the plant, stalk, leaves, root and if possible, some of the flower or fruit.

2. Gross anatomical lesions, where a bacteriologic examination is desired, are conveniently sent packed in an ample quantity of borax. A corrugated paper or wooden box is usually preferable to an air-tight container (can). As a second choice, such specimens may be carefully wrapped in a cloth, wet in a 10 per cent solution of formalin and properly boxed.

3. Specimens of tumors or other tissue, of which a bacteriological examination is not desired, may be sent in a 4 per cent formalin solution.

4. Specimens of blood, pus and body fluids for bacteriological examination or for serum tests should be drawn aseptically and sent in sterile containers (small bottles previously boiled and cooled), stopped air-tight. It is important that such specimens reach the laboratory as quickly as possible. If sent by parcel post, they should always be sent special delivery. Usually, it is best to send blood, pus and



Royal Dick College, Edinburgh, Scotland, where the following officers of the veterinary corps, A. E. F., took a post-graduate course: J. H. Allen, Cornell University, '15, Salt Point, N. Y.; Richard E. Butler, McKillip Vet. College, '13, Sparta, Wis.; William C. Callander, McKillip Vet. College, '17, Lanesville, Ohio; David R. Edwards, Grand Rapids Vet. College, '14, Cambria, Wis.; Shelley O. Fisher, Cincinnati Vet. College, '17, Liberty, W. Va.; Leo J. Gallagher, Ontario Vet. College, '17, Elroy, Wis.; L. F. Holmes, Chicago Vet. College, '16, Kendall, Wis.; John R. Ludwigs, Kansas City Vet. College, '16, Walla Walla, Wash.; Glen B. Maris, Indiana Vet. College, '16, Indianapolis, Ind.; William G. O'Connor, Pennsylvania University, '16, New Bedford, Mass.; Richard K. Roberson, Alabama Poly. Institution, '16, Seddon, Ala.; Edward R. Steel, Cornell University, '14, Grundy Center, Iowa; Gustav W. Utter, McKillip Vet. College, '13, Fairmount, Minn.; Lawrence F. Vaughn, Kansas City Vet. College, '16, Reading, Mich.

body fluids by first class mail, special delivery. Where the quantity of pus obtainable is very small, it should be diluted with sterile normal salt solution to prevent it and the organisms from drying en-route. Sterile containers will be supplied free upon request.

5. In suspected cases of rabies, send the whole head wrapped in a cloth, wet with 10 per cent formalin solution.

Cows Lead All Farm Animals in Value

THE expansion which has been taking place steadily in the dairy industry of this country during the last seven years has at last put milk cows at the head of the list of farm animals so far as value is concerned. This is shown by a recent report by the Bureau of Crop Estimates, United States Department of Agriculture. The value of these animals now exceeds that of horses and cattle other than milk cows, the two classes formerly standing higher on the list. On January 1 of this year there were approximately 23,747,000 milk cows in this country, an increase of 272,000 head, or 1.2 per cent, as compared with a year ago. Their aggregate value is placed at $2,021,681,000.

Ten years ago the average milk cow was worth $35.29, compared with $78.20 a year ago and $85.13 January 1, 1920. It is generally recognized that the quality of the milk cows of this country is improving at the same time that their number is increasing.

The class of cattle, consisting of calves, steers, bulls and cows, not kept for milk production and designated as "other cattle," shows a decrease of 700,000 head, or 1.6 per cent. Ten years ago the average value per head of animals in this class was $19.07, a year ago it was $44.22, and $43.14 this year. The number of "other cattle" in the country at the present time is approximately 44,385,000, and their value $1,914,575,000.

The foregoing, from the U. S. Department of Agriculture, indicates the reason for the large increase in dairy practice during the past five years, and particularly during the past year or two. Veterinarians should encourage the dairy industry by every means possible. To do so not only increases the prosperity of their communities, but increases their own practices along very desirable lines.

Dairymen and prospective dairymen should be cautioned, however, that it is only the profitable cow—the good producer, proved so by actual test—that they can afford to keep.

The following, also from the Department of Agriculture, indicates that the non-competitive market that the dairy industry has enjoyed during the recent past is about to give way to competition from countries that can produce butter, cheese and condensed milk more cheaply than it can be produced here, and that it is only by superior methods of milk production and manufacture of milk products that our dairy industry may expect continued prosperity, such as it has had in the recent past;

"Arrivals of shipments of Danish butter are already affecting prices on the New York City market. Argentina is producing nearly three times the amount of butter and cheese consumed, and some of the surplus may be expected to come to this country or compete with our products in foreign countries. Before the war Siberia was rapidly extending its dairy industry, and when conditions become settled in that country it may be expected to come back as a factor in the world's market. Recently there have been signs of interest in dairying in South Africa, and the industry as developed in New Zealand and Australia must be reckoned with.

"If the dairy products manufactured in the United States are of a better quality that those from other countries, they need not fear competition. Canada's cheese industry illustrates this. A strict system of government supervision in the training of cheesemakers, in the operating of the factories, and in the grading, marketing and exporting of the product exists there. This has tended toward an improvement in the quality of Canadian cheese until it ranks with the finest on the English markets."

FEWER FARM ANIMALS LAST YEAR

A slight increase in the number of milk cows and mules and a moderate decrease in the number of other cattle (calves, steers, bulls, and cows not for milk), horses, sheep and swine are the outstanding features of a survey of live stock on farms and ranges of the United States on January 1, as compared with a year ago, made by the Bureau of Crop Estimates, United States Department of Agriculture.

Milk cows have increased about 272,000 head, or 1.2 per cent; mules increased 41,000 head, or 0.8 per cent; "other" cattle (as designated above) decreased 700,000 head, or 1.6 per cent; horses decreased 373,000 head, or 1.7 per cent; sheep decreased 251,000 head, or 0.5 per cent, and swine decreased 1,675,000 head, or 2.2 per cent.

The estimated number of animals on farms and ranges January 1 are 21,109,000 horses, 4,995,000 mules, 23,747,000 milk cows, 44,385,000 other cattle, 48,615,000 sheep and 72,909,000 hogs. The total of all animals is 215,760,000, which is 2,686,000 head, or 1.2 per cent less than a year ago.

The total value of all farm animals on January 1 was about $8,561,000,000, which is a shrinkage of $266,000,000, or 3 per cent, compared with a year ago. It is an interesting observation that mules and milk cows, which increased in numbers, also increased in value per head, whereas all other classes of animals decreased in value per head as well as in total numbers.

HOUSE AGREES ON ARMY REORGANIZATION BILL

The Army Reorganization Bill was passed by the House of Representatives on March 18. There was no material change made in the text of the bill on the floor of the House as it was considered section by section.

The Medical Department, section 10, was considered on Friday, March 12, and agreed to without any comment as regards the Veterinary Corps. The section provides "The Veterinary Corps shall consist of 140 officers in grades from colonel to second lieutenant, inclusive." The Army as authorized by this bill will consist of 299,000 enlisted men and about 17,720 officers. For an army of this size, with its organizations of infantry, cavalry, field artillery, machine guns, etc., it will require a minimum of 347 officers to do the work necessary for a veterinary service as now organized in the Medical Department and not less than 2,500 enlisted men.

In the Senate army bill provision is made for 200 veterinary officers from grade of colonel to that of second lieutenant and 1,500 enlisted men.

It is hoped that when these two bills are sent to conference, where the army reorganization measure will be drafted that will define the military policy of the country for the immediate future, the veterinary profession will be able to impress upon the conferees the necessity of providing adequate veterinary service to take care of the army animals and meat and dairy inspection, to the end that they will authorize not less than 200 permanent officers for the corps and at least 2,000 enlisted men.

Veterinarians everywhere should hold themselves in readiness to bring to bear on members of Congress every influence they possess in the support of an adequate veterinary corps for the army. Such is nothing less than needed recognition of the veterinary profession. Your help will not be asked unless it is needed. If it is asked, give it without reserve.

TWO STRAINS OF BOTULINUS RECOGNIZED

The serum that saved the life of Lena Delbane, after the other six members of her family had died from eating poisonous olives in New York, was made in the Bureau of Animal Industry of the United States Department of Agriculture from the blood of sheep that had been immunized against Bacillus botulinus poisoning.

The Bureau of Animal Industry has made extensive experiments with botulinus serum, because the Bacillus botulinus, as every veterinarian knows, is suspected of causing forage poisoning in horses, and possibly in cattle also. It was discovered by the Bureau that there are two strains of Bacillus botulinus, so called because of their source, the olive strain and the cheese strain.

Morphologically, they are alike, and the toxins they produce have the same effect

on man and animals. However, immunization against one strain does not afford protection against the other.

A large number of cases of botulinus poisoning have been reported during the past three or four months, due to eating ripe olives. Most of these cases have resulted from consuming the olives of a single factory, and all have been produced by olives canned in glass.

Poisoning and deaths that have occurred from use of these olives are simply the result of careless methods in canning, the botulinus, being a very resistant organism, was not destroyed by the heat to which the olives were subjected in the canning process.

In only one case was it reported that olives that caused poisoning were in good condition. In all other cases the olives gave plain evidence, both by sight and taste, that they were partially spoiled. In view of the wide distribution of botulinus organisms and the serious effects of the infinitesimal amount of its toxins, it is hazardous to use for food any canned article that gives the slightest evidence, either by appearance, smell, taste or by swelling of the can, absence of the tin coating from the inside of the can, or in any other way that it has not been perfectly preserved.

Colonel C. F. Morse, M. C., Director, Veterinary Corps, U. S. Army.

DISTINGUISHED SERVICE MEDAL AWARDED TO COL. C. F. MORSE, DIRECTOR OF VETERINARY CORPS

By direction of the President, under the provisions of the Act of Congress approved July 9, 1918, a Distinguished Service Medal has been awarded Col. Charles F. Morse, Director of Veterinary Corps, for exceptionally meritorious and distinguished service based on the following citation:

As director of the Veterinary Corps, by displaying exceptional energy, zeal, and good judgment he organized and administered with marked success a veterinary service capable of meeting every need in home territory and in the theatre of operations. He provided effective means for the treatment of sick and wounded animals, for the prevention of disease among well animals, for the inspection of meat and dairy products used by the army, and through the establishment of schools of instruction placed the personnel of the Veterinary Corps of the Army on a high plane of efficiency.

The Surgeon General in recommending this award states:

This officer was largely instrumental in building up a veterinary service during the war from practically nothing to 2,180 officers and 20,000 enlisted men and upon him devolved the care and treatment of the sick and wounded arising among 465,000 animals. Aside from the obligations to be met in home territory he was responsible for the organization and dispatch overseas of all veterinary personnel and material required there. Believing that suitable recognition should be accorded the officer in home territory who not only made the overseas achievements possible but also successfully overcame a task of great magnitude here, and as final evidence of appreciation of the splendid services rendered by the veterinary profession of America during the World War, I recommend that this paper be given earnest and favorable consideration.

In acknowledging this award, Colonel Morse made the following comment:

"It is impossible for me to express adequate appreciation of the great honor conferred by this award. What seems of far greater importance than any

personal consideration is the high compliment thereby paid the personnel of the veterinary corps and the veterinary profession of America. While I may have played an humble part in placing "the personnel of the veterinary corps of the Army on a high plane of efficiency," no one knows better than I how essential to the attainment of this object have been the whole-hearted enthusiasm, the faithful attention to duty and the intelligent, well-directed efforts on the part of my colleagues in this office and of the veterinary officers of the army at large which have been constantly in evidence. No one realizes more acutely the discouragements encountered and the obstacles overcome, both in this country and in France, by officers of the veterinary corps through the exhibition of these qualities. The sacrifices made by the civilian veterinarians were equal to those made by men in other walks of professional life and are deserving of the same high commendation. Our enlisted men as a body were of splendid type, and while not veterinarians themselves rendered services of vital importance to success. If the patients with whom they labored faithfully could but speak, no other praise would be needed.

"No one man made the veterinary corps any more than one man can hold it up to its high standard. Each individual participating in this achievement is deserving of credit for his share, and it should be a matter of lasting pride to him that the result has been deemed worthy of official recognition. It is with the utmost satisfaction that I avail myself of this opportunity to congratulate every man of the veterinary service on having had the privilege of writing his few lines in that magnificent chapter of the history of the veterinary profession of America, the army veterinary service of the World War."

MERILLAT COMES BACK

Not to his place of leadership among veterinarians in matters surgical for he has not been out of that position; but back to his old department of surgery in the Journal, which was dropped during the time his services in the army interfered with his conduct of this important department. Readers everywhere will rejoice to know that the useful, timely information and helpful advice that always characterize Colonel Merillat's writings will be available again in the monthly grist of good things that the Journal brings.

VETERINARY SERVICE OF THE ARMY*

The following orders of transfer and reassignment have been issued for veterinary officers:

Major A. Mitchell, V. C., from Camp Funston Remount Depot, Kan., to Louisville, Ky., for duty as Purchasing Zone Veterinarian for Eastern Purchasing Zone for public animals.

Major Charles H. Jewell, V. C., from duty in the Veterinary Division, Surgeon General's Office, Washington, D. C., to Fort Riley, Kan., for duty as Post Veterinarian and as Officer in Charge of Veterinary Instruction in the Cavalry School, Fort Riley.

Major B. A. Seeley, V. C., from Remount Depot, Camp Meade, Md., to Chicago, Ill., for instruction in meat inspection.

Captain J. W. Crouse, V. C., from Chicago, Ill., to Remount Depot, Camp Pike, Ark., for duty as The Veterinarian.

Captain K. F. Hinckley, V. C., from Chicago, Ill., to Fort Myer, Va., for duty as Post Veterinarian.

Captain H. S. Eakins, V. C., from Veterinary Division, Surgeon General's Office, Washington, D. C., to Chicago, Ill., for duty.

Captain C. L. Miller, V. C., from Fourth Division, Camp Dodge, Iowa, to Camp Funston, Kan., for duty as The Veterinarian, R. D., that camp.

Captain H. Clarke, V. C., from duty in the Veterinary Division, S. G. O., Washington, D. C., to Fort Jay, N. Y., for duty as Post Veterinarian.

Captain William H. Dean, V. C., from Fort Jay, N. Y., to Camp Jackson, S. C., for duty as Camp Veterinarian.

Captain C. M. Gilchrist, V. C., from duty with First Division, Camp Taylor, Ky., to Remount Depot, Camp Taylor, Ky., for duty as The Veterinarian.

Captain W. A. Sproule, V. C., from Remount Depot, Camp Taylor, Ky., to First Division, Camp Taylor, Ky., for duty as Division and Camp Veteriarian and Veterinary Instructor in the Field Artillery Basic School, that camp.

Captain J. R. Mahaffy, V. C., from Remount Depot, Fort Bliss, Texas, to Chicago, Ill., for instruction in meat inspection.

Captain F. B. Gage, V. C., from Camp Lewis, Wash., to Chicago, Ill., for instruction in meat inspection.

Captain C. S. Parker, V. C., from Fourth Division, Camp Dodge, Iowa, to Chicago, Ill., for instruction in meat inspection.

First Lieut. J. G. Catlett, V. C., from Remount Depot, Fort Keogh, Mont., to Louisville, Ky., for duty with the Eastern Purchasing Zone Officer for public animals.

First Lieut. G. L. Caldwell, V. C., from Chicago, Ill., to Honolulu, Hawaiian Islands, for duty.

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*From the office of the Surgeon General.

First Lieut. E. L. Jarvis, V. C., from Front Royal, Va., to Louisville, Ky., for duty with the Eastern Purchasing Zone Officer for public animals.

First Lieut. R. M. Buffington, V. C., from First Division, Camp Taylor, Ky., to Chicago, Ill., for instruction in meat inspection.

First Lieut. F. B. Croll, V. C., from Kansas City, Mo., to Fort Bliss, Texas, for duty at Remount Depot, that post.

First Lieut. A. H. Chamberlin, V. C., from Remount Depot, Camp Travis, Texas, to Fourth Division, Camp Dodge, Ia., for duty.

First Lieut. C. L. Nelson, V. C., from Remount Depot, Camp Travis, Tex., to Fourth Division, Camp Dodge, Iowa, for duty.

First Lieut. J. W. Graham, V. C., from Remount Depot, Camp Meade, Md., to Remount Depot, Camp Lee, Va., for duty.

First Lieut. J. P. Gerety, V. C., from Remount Depot, Camp Lee, Va., to Fort Clark, Texas, for duty as assistant to the Post Veterinarian.

Second Lieut. O. W. Anderson, V. C., from Camp Sherman, Ohio, to Fort Monroe, Va., for duty as Post Veterinarian.

Second Lieut. J. W. Timmons, Jr., V. C., recently arrived in this country from Coblenz, Germany, to Chicago, Ill., for instruction in meat inspection.

OFFICERS VETERINARY CORPS, UNITED STATES ARMY

Temporary Rank, Authorized by Congress in Bill Providing 18,000 Officers Until June 30, 1920

	On Duty	
	Feb. 11, 1920	Mar. 11, 1920
Colonels	0	0
Lieutenant Colonels	3	3
Majors	35	34
Captains	73	69
First Lieutenants	142	141
Second Lieutenants	72	71
	325	318

CHEMICAL INFLUENCE ON TUBERCLE BACILLI OF HYPOCHLORITE SOLUTIONS

The disinfection of premises following the removal of tuberculous animals has been generally recommended and practiced. The value of such procedure is somewhat difficult to estimate from the evidence now in hand. To be of value a disinfectant must have the power to overcome the physical and chemical influences which it encounters when brought in contact with the media in which tubercle bacilli are naturally found. Practically all live stock sanitarians recognize the probabilities of not satisfying these requirements, and they, therefore, include in their directions distinct reference to the mechanical removal of infective materials by cleaning, scraping, etc.

Hypochlorite solutions have recently received considerable notice and large quantities are being sold to dairymen under various proprietary names.

Two series of experiments have been conducted exposing very thin films of tuberculous lung materials for from 1 minute to 22 hours to the action of solutions containing .5 per cent to .3 per cent available chlorine. From our results it is impossible to draw definite conclusions as to the effect of chlorine solution on tubercle bacilli contained in tuberculous discharges from cattle. It is not surprising to find some unlooked for results in such experiments, but some of the results are, nevertheless, difficult to explain. It was hoped to be able to plot out a curve from the results of the experiments made that would indicate the concentration of chlorine solutions and time of exposure that would kill the tubercle bacilli. The results obtained, however, did not permit the establishment of such curve. The variables which are ever present in the practical disinfection of cattle environs were here also important factors in bringing forth uneven results. Among these are:

1. The amount of tuberculous material (in our experiments this was crudely estimated).

2. The complex composition of the tuberculous material.

3. The affinity of chlorine for the tuberculous material.

4. The affinity of chlorine for the objects carrying the tuberculous material.

In a general way the results indicate:

1. That chlorine solutions do not kill tubercle bacilli momentarily in naturally infected discharges.

2. That chlorine solutions are capable of destroying tubercle bacilli under certain conditions; such favorable conditions were not determined by these experiments.

3. That tubercle bacilli were at times not destroyed when subjected to more severe exposure than given in practical disinfection.

*Report, University of California Experiment Station.

DEPARTMENT OF

CATTLE PRACTICE

Edited by JOHN FRANCIS DE VINE, D. V. S.

Chronic Metritis

AT the present time it appears as if the term chronic metritis is undergoing a change as to its meaning, with reference to the tissue involved. I believe it has long been generally accepted that endometritis was a term applied to an inflammation of the mucous membrane lining the uterus, and the word metritis has been used to designate certain inflammatory or circulatory changes in the body (walls) of this organ, and that pyometra or pus in the uterine cavity was the result of a chronic metritis rather than a chronic endometritis; in fact, authorities on human gynecology state that the endometrium seems to be peculiarly immune to what might be termed a permanent infection, but according to the splendid work recently done by Hallman, Hadley, Ward and Salsbery, it would appear that in acute infections of the uterus, we may and do have acute endometritis, acute metritis and acute metro-peritonitis, but that the severe pathological changes that we so dread as leading to sterility, consist of a mucoid degeneration of the epithelium of the mucosa with deeper seated foci of fibrosis, and that these foci of fibrosis are due to colonies of bacteria of a low virulence and that they have a serious effect on the uterine glands and are ordinarily not influenced by antiseptic or disinfecting treatment of the uterus. We have in the past attempted to make a differential diagnosis between chronic endometritis and chronic metritis, principally by the physical condition of the organ, determined by palpation and the character of the exudate or discharge; considering the chronic pronouncedly enlarged organ and the presence of pus as diagnostic of chronic metritis in contra-distinction to a slightly enlarged, too flabby or too rigid uterus, with the absence of any exudate excepting during the estral period, as indicating chronic endometritis.

Evidently from the knowledge being gathered at the present time these are but different degrees of chronic endometritis, the pathological changes involving the mucosa only; nevertheless in describing these inflammations of the mucosa, some investigators use the words, metritis and chronic metritis, which of course answer all purposes generally speaking, but may be confusing to the practitioner giving special attention to this work. It would seem well, therefore, if our pathologists would set us straight on the matter, a thing they will no doubt do in the near future with the splendid progress they are now making.

By referring to our previous article on "Acute Endometritis," it will be noted that our special concern was to clean up the uterus as promptly after parturition as possible, with the hope of preventing or aborting two serious complications or sequalae. One being puerperal septicemia and the other a severe inflammation which if uncontrolled leads to either pyometra or a fibrous involvement of the fundus or horns and tubes, sufficient to render the animal an irregular breeder or hopelessly sterile. Every capable worker in abortion herds recognizes that these are the cases that not only dishearten the stock owners but also the veterinarian, but as evidence of our march of progress on this scourge, I would again call attention to the findings by the workers before referred to. They have now determined that it is highly probable that secondary invaders attack the inflamed uterus that has recently suffered abortion or retained placenta, and are accountable for these disastrous changes, the bacillus

pyogenes, either alone or with other organisms, being the one most constantly recovered, streptococci and the B. coli communis being frequent companions, while the abortus bacillus is evidently absent in most or all cases of chronic metritis.

As an outgrowth of this knowledge, some workers are of the opinion that it should be possible to produce a biologic, probably a bacterin, of the organisms that are most constantly recovered, that could be used in conjunction with irrigation of a uterus which has suffered abortion or retained placenta, with the hope of hastening it to recovery, rather than to allow these invading organisms to work such havoc in the structural changes, as to prevent future conception.

If these hopes are realized it will be a pronounced step of progress in lessening the percentage of our irregular breeders and hopelessly sterile animals.

TREATMENT FOR SORES ON TEATS

What treatment is satisfactory for sores on the ends of teats involving the duct orifice?—M. R. P.

REPLY by DR. DE VINE: If the duct or orifice of the teat is involved sufficiently to cause constriction and interfere with milking, one of two things must be done.

The orifice must be distended with a teat dilator and kept moderately dilated with any of the plugs that are on the market for the purpose. The size and length of the plug to be used will depend upon the individual case. It is better to use one that is too long rather than one that is too short, and one that is sufficiently large to keep the parts well stretched.

If the orifice cannot be stretched in this manner, then the duct should be curetted sufficiently to allow the milk to flow in a much larger stream than normal. It should then be treated antiseptically. A good way is to pass a probe which has been dipped in iodin into the duct and smear the tissue of the duct which has been injured or curetted. After the parts have been well covered with iodin, the probe or dilator should be dipped in any mild antiseptic ointment, then replaced and left in the teat continuously, except when milking, until the teat is healed.

The necessity of repeating the iodin treatment must be left to the judgment of the veterinarian treating the particular case. I have seen teats where it seemed advisable to smear them with iodin every day and others perhaps every second or third day.

If the teat tissue remains thick and hard after the duct is healed and the teat milks well, the thickness can usually be reduced by absorbent ointments or a mild blister. Some prefer a mild irritant ointment of red iodid of mercury, others an iodin ointment.

DRY FOOD CAUSES IMPACTION

During the past few weeks I have autopsied a number of cattle, and found the omasum impacted, and the contents firm, dry and dark in color.

The symptoms were the same in each case. Please inform me if there is anything that can be done to relieve this condition.—L. C. C., Ill.

REPLY by DR. DE VINE: We must not overlook the fact that the omasum of all cattle that are being fed on dry fodder has the appearance of being firm, dry and often dark in color, particularly in cold weather when the cattle drink but little. This is so common and constant that during the winter season the farmer and the lay butcher almost invariably diagnose any obscure death as due to "impaction of the book."

If the animals described above had been eating succulent feed, or if part of their ration was succulent food, such as silage and roots, and the condition of the omasum was not as moist as it should be, we then might have occasion to regard the condition of the omasum as something specific, but it would not be safe to venture a diagnosis without having further history of these cases with reference to their general care, fodder, possible access to minerals, etc.

Dr. J. W. Kalkus of the veterinary department at the college at Pullman, Wn., recently spent a month in lecturing throughout the state before farmer's organizations in connection with the extension department of the college.

Department of Surgery

By DR. L. A. MERILLAT

Remarkable Changes Noted in Veterinary Profession

IN undertaking again to edit the Department of Surgery for the Journal, full account is taken of the remarkable changes the veterinary profession has undergone since this service was discontinued just before our country entered actively into the great war. The shifting of interest from the horse to the meat-producing animals by the rural practitioner, and from the horse to the ever-convenient dog by the urban veterinarian is fully comprehended and will be kept in mind. The change of our theater of operation is of course due to the fact that motor-drawn vehicles and machinery have supplanted the horse faster than its roasts have tempted the palates of the epicures.

In a recent visit to Chicago and other cities it would have made a champion of animal surgery weep to see the abandoned and dust-ridden operating tables everywhere, indicating silently but certainly that great changes have been wrought. Conversing with veterinarians anent the situation, elicited universally the same information that operations such as are now done on the horse are invariably performed as of old—in the stable, with a twitch, pocket case and a bucket of antiseptic. And everywhere the same cause for the change was given. Horses are cheap (computed at the present price of the dollar) and care is entirely too costly to maintain a horse hospital with profit. This is a condition, not a speculation.

Furthermore, at the great meetings of veterinarians, local, state and national, the horse, once our chosen subject for discussion, is seldom mentioned. The dairy cow, the hog, and the once entirely ignored sheep occupy the entire attention. Poor old Dobbin seems to be eliminated from our serious thoughts. Once the subject of our most profound deliberations, he is now dethroned. If the horse were not still the type for our anatomical and physiological studies, it is indeed doubtful if the veterinary student would hear much about this former king of domestic animals. In fact it is evident at every turn that we are passing through a period that recurs at more or less regular intervals in veterinary history. There is nothing that plays such havoc with veterinary practice as low cost of animals combined with high cost of maintenance. Today both of these exist in the superlative degree so far as the horse is concerned. The present generation of veterinary practitioners may be thankful they have hog serum work to occupy them and an enterprising live stock industry that has developed meat-producing and milk-producing animals of sufficient value to assure continued prosperity even with the horse eliminated. The past generation of veterinary practitioners were less fortunate, for when horse values fell there were no other resources of consequence.

But, let us not deceive ourselves that it will always be thus. The horse is not permanently dethroned by any means. Unless all signs fail we shall soon see the horse occupying once more much of our attention. The situation only needs readjustment. While it is true that we have a very large horse population there is a shortage of useful animals that is not being met by any general interest in breeding. The result is easy to foresee. Horseless agriculture is the dream of the moment, just as the horse-

less city was the dream of twenty years ago. The latter has not materialized and the former is out of the question in the minds of the thoughtful. I can imagine no more pitiful plight than a farmer without a horse, despite the present and the future refinement of machinery. Farming with fewer horses? Yes. Farming without horses? No. It can't be done.

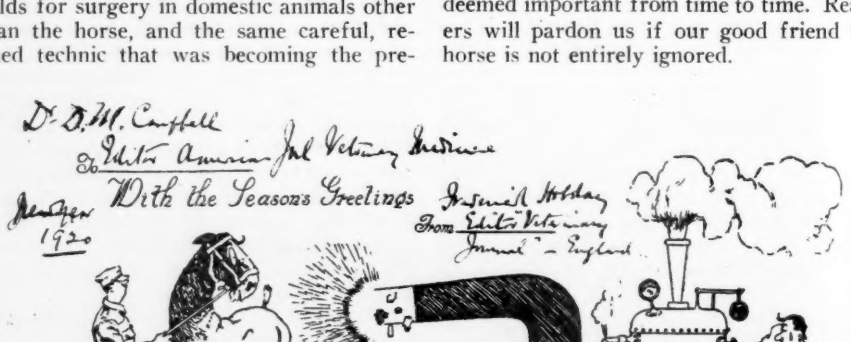
Work-horse breeding in America has always been a slip-shod industry. There has been a lack of general interest in the development of useful, suitable types, and the result has been the stocking of our country with millions of worthless creatures and still other millions unsuited for the work they do.

The role of veterinarian should play in the rehabilitation of the horse industry is that of championing the cause of good breeding and of fighting incessantly the breeding of scrubs. Then as the horse "comes back" it will be worth while.

Despite this adverse condition as regards the horse, veterinarians can ill afford to allow surgery to fall behind the other branches of the science. Today more than ever we should strive to keep surgery on the high plane it was so rapidly reaching when our attention was attracted to other things. Besides there are great unconquered fields for surgery in domestic animals other than the horse, and the same careful, refined technic that was becoming the prevailing scheme of the horse surgeon must now be carried to, and utilized in the other domestic animals. The canine surgeon needs no advice, for it is he who probably has set the best example in the past, and the bovine and the porcine practitioners might well emulate his example by carrying the same refined practices into the dairy and the pig sty.

Surgery to be useful as a corrective or curative measure must be done well. If not done well it had better be left undone. Well performed surgery always brings its reward and stamps the operator as a peer. Now that we have the $100,000 cow and the $40,000 hog under our care, it behooves us to develop and standardize a surgical technic for these animals such as the passing generation of veterinarians developed for the horse. The possibilities are as unlimited. Let us see what this department can do to awaken an interest in keeping surgery pacing progressively with every other remedial measure utilized by the modern veterinarian.

It will be the purpose of this department to review the world's literature on animal surgery, to report cases of special interest, and to give such surgical hints as may be deemed important from time to time. Readers will pardon us if our good friend the horse is not entirely ignored.



Major Hobday, editor of the "Veterinary Journal," London, spent three or four years with the British Expeditionary Forces in the Near East. At Christmas time each year he remembered friends with cartoons of a ludicrous nature, of which the above is the latest. Readers will recall the one from Saloniki a year ago.

DILATION OF RECTUM LEADS TO RUPTURE

I was called to treat an eleven-year-old mare, in good condition, for what the owner thought was a bad case of colic. When I arrived the mare was standing at the manger eating hay like a good fellow. At sight, I thought here was a case that would pay the electric light bill, as there would not be much expense attached to the treatment. The owner informed me that the animal was all right and that he evidently had been too easily frightened. Presently the patient walked to the far end of the stall and strained violently in a vain attempt to urinate. It seemed as though some foreign body was present which could be expelled with slight effort. Several attempts were made between spells of eating. The temperature, pulse, respiration and peristalsis were normal, so I decided to explore both rectal and vaginal cavities. In doing so, I discovered the rectum was so full of fecal matter that it was impossible for the animal to expel it. After removing a half bushel measure full, I found the intestine absolutely severed from the rectum at the point where the intestine came over the ischium. I ordered the mare to the hospital at once, and after dieting her for forty-eight hours, attempted to correct the condition by drawing the intestine to the anus and suturing there, but the irritation only caused more violent straining and the sutures were torn out. The subsequent swelling disparaged further attempts at suturing.

The mare is still eating heartily and doing nicely, but we inject a bucket of water two or three times daily to evacuate the rectum.

I have informed the owner that I have nothing encouraging to offer him. I have talked with several neighboring veterinarians, and, as the condition is new to them, they have no suggestions to offer. I would be glad to hear from any who may have had similar conditions to deal with.—G. H. C., Illinois.

REPLY: The mare in question is suffering from rupture of the rectum, due to an ancient dilatation. The rectum has been impacted before and if not noticed recoveries were spontaneous. This is by no means an unusual condition in horses past the age of fifteen. I have no recollection of ever having met cases in younger animals. The first symptoms are futile attempts to defecate, but later, when the pelvic cavity becomes filled, the pressure upon the bladder transfers the sensations to the urinary apparatus. Manual removal of the dry impacted mass is sometimes difficult, and if the operator is not exceptionally gentle with his manipulations the hand is likely to pass right through the thin, drawn-out rectal walls. Great patches of the walls are often as thin as tissue paper, so thin that the hand passes through them unnoticed. This patient will eventually succumb to peritonitis.—L. A. M.

SUTURE OF GAPING WOUNDS

I learn with much satisfaction that we are to have the Department of Surgery again, and I desire some information from that department.

Is a double row of sutures indicated in large, gaping wounds? How may they be inserted to the best advantage?—A. A. Z., Wisconsin.

REPLY: Large, gaping wounds in horses seldom remain closed when only one row of sutures is used. Tension necrosis always loosens them or tears them out entirely long before the healing process has advanced far enough to assist in the retention. A large wound once well cleaned and rid of all badly devitalized shreds can, on the other hand, be permanently approximated by using two or, still better, three rows of sutures. The first ones should be a set of crucial or mattress sutures inserted deeply and widely, but drawn only tight enough to bring the edges loosely together. Using the language of the seamstress, the wound is merely basted. They bring up the edges into a better position to do the more particular part of the procedure, and when the operation is complete they serve as supporting sutures. The second row constitutes the real approximating sutures. These should be the common, interrupted variety, inserted into the very edges of the wound and very close together, care being always taken not to infold the skin, as healing can never occur promptly when epithelial surfaces contact each other. The third row of Mayo's running loop will assure retention of the whole flap to the end of the healing process, even if the traumatic cavity become badly infected. Gravity drainage through a properly located orifice must, of

course, not be omitted. If the drainage system is well planned and there is assurance that it will be well maintained, the entire area may be safely varnished over with several layers of collodion. It is always well, however, in practicing this taut method of suturing to administer a preventive dose of antitetanic serum.—L. A. M.

FOUNDER OF THE HORSE

(Continued from Page 156)

heretofore appreciated by anatomists and physiologists is accurately described and its functioning proved by experimental data.

In the third chapter the author brings out the singular fact never before signalized that there is no pulsation in the pedal arteries of the sound foot, but that in chronic founder when the regulating apparatus is damaged by structural changes pulsations exist.

Chapter IV is a close study of the etiology. After giving all the usual predisposing and determining causes the "mental causes" of founder are related. The opinion is given that mental agony through its influence on the circulation may cause founder. Driving a horse beyond its accustomed stopping place, forgetting to feed a hungry horse while the others adjacent are fed, rehitching a horse without having given it its ration, and crossing a ford, are among the circumstances which are cited as to induce founder.

Chapter V is an exhaustive study of the pathological anatomy. It is profuse in instructive detail and original illustrations, unfolding the author's rather revolutionary conception that founder is not an inflammatory state of the podophyllous membrane and third phalanx, not a localization or metastasis, but a result of immediate and direct action of causes purely mechanical—an augmentation of the arterial blood-pressure.

Chapters VI, VII and VIII relate the usual semeiology and the diagnostic methods, and while described in great detail and with especial care, there is little brought out that is not well known to experienced practitioners.

Chapter IX deals with the prognosis, and while brief is interesting and to the point, giving the circumstances and combination of circumstances which produce dire results.

Chapter X describes the author's methods of handling cases of founder in minute detail. His treatment is as revolutionary as his new pathology. Blood-letting in large quantities is recommended for acute founder, with the exception of certain contra-indications carefully described. Aconite is the chief medicant. His pathology naturally calls for its hyposthenic action. It is, however, in advising the use of "friction excitants," e. g., terebinthinae to the coronets to make the patient use its legs and the resort to forced exercises regularly and faithfully executed that the author wanders farthest from the orthodox therapy of the past. The wisdom of these methods seems to be supported by ample clinical evidence and incontrovertible arguments.

The chapters, headlines, subheads and paragraphs are well arranged and the diction leaves little to be desired. It should be translated for the English teacher, student and practitioner.

In the treatment of chronic cases, two courses are advised. The one is the usual palliative shoeing, including certain plans of paring the foot, and the other, the author's preference, is a radical surgical operation, consisting of the avulsion of the horn of the posterior part of the walls, that of the bars and of the posterior part of the frog, exposing the velvety tissue of the heel region. The velvety tissue exposed is submitted to a curetting and the wound dressed to exclude infection. The operation is intended to provoke the formation of new vessels which are endowed with normal vaso-motivity by the destruction of a part of the arterial plexus of the plantar artery.—L. A. M.

Dr. J. F. DeVine, of Goshen, N. Y., recently addressed the South Carolina Live Stock Association and spent several days in the palmetto state, and engaged in sterility work among some of the finest herds thereabout.

Dr. Charles M. Elliott, of Beaver Crossing, Nebraska, has disposed of his practice to accept a position as a veterinary practitioner with Dr. Peter Simonson, of Hooper, Nebr.

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

Readers are urged to take advantage of the opportunity offered by Dr. Pammel, for the identification of specimens of supposedly poisonous plants. Two good-sized specimens, carefully packed, should be sent to him direct with such history as may be available. Simply mention that you are a reader of the AMERICAN JOURNAL OF VETERINARY MEDICINE and no charge will be made for this service.

Photographs of Poisoned Animals Wanted

It is important that I have photographs of animals poisoned or suspected of being poisoned. Therefore, will not the readers of the Journal send me such photographs with statements regarding the plants which caused the poisoning?

The writer is preparing a new edition of the "Manual of Poisonous Plants," and such material will prove useful for this work. Full credit will be given. Address communications to L. H. Pammell, Ames, Ia.

CASTOR SEEDS POISONOUS

CASES of poisoning from the castor bean in human beings are not numerous. Now, however, E. White reports on poisoning of horses with castor oil bean seeds. A farmer fed a handful of castor beans, not more than two ounces, with fatal results.

"That night the horse refused his feed, and as this continued next day I was 'phoned to come to see him. In the meantime mixed corn had been delivered at this farm, and some was sent on to the other farm about six miles away. Five horses were given their midday meal at the first farm, and shortly after I received an urgent message to go to see them. I found the animal that had been to the mill off his feed, the food being untouched in the manger. Looking it over, I found some of the 'beans,' and recognized that they were castor seeds and the cause of the trouble. Two other horses had nearly finished their feed, perhaps a quarter being left. They were standing heads down, shivering, temperature 103° F., pulse 72 in one case and 84 in the other; feces scanty, passed in small amounts, and covered with a brown, tough mucous; breathing faster than normal, but no signs of abdominal pain.

"Two other horses I found later, had had a feed and been turned out to grass afterwards, and I did not see them that day.

"In the meantime a traveling stallion had been put into a box vacated by one of these horses and had taken a few mouthfuls of the mixture left in the manger before his groom could clean it out. This horse was then fed oats which the groom brought with him and these he cleared up.

"Next morning I found the first two horses worse as regards pulse and temperature (90 and 82 pulse, temperature 105° F. in both), but nothing further noticeable; feces as before.

"In the afternoon one horse was purging and obviously had not long to live: was in great pain, blowing, haggard expression, cold, pulse about 100°. The other had acute laminitis and was also very ill. The first died during the night, and the second was shot on Saturday, as it was evident, even if he recovered, he would be of no particular value.

"During the morning visit I found the stallion ill, showing the usual symptoms in a mild form. The animal that had been to the mill and had only had a few ounces of beans was better, but I had two more patients in the animals that had been fed and turned out to grass. These four were practically recovered on the following day

except that they were very dainty as regards feeding.

"After the messenger arrived at the second farm with the warning regarding the food the mangers were cleared out and the collected material foolishly thrown on the manure heap. Two colts which were running in the yard at night found it and next morning both were ill. The larger and stronger, having no doubt got the lion's share, was really ill, shivering, blowing, slightly reeling gait, pulse 84, temperature 105°, and the same peculiar feces. I am glad to say these animals recovered, there being only one death among eleven poisoned animals at this farm.

"At the first farm some clearings from one of the mangers was given to two pigs, and next morning they were both purging and vomiting, and completely off their feed. Both recovered.

"At the postmortem examination of the first horse I noticed some fowls pecking at a large piece of blood-clot, and next morning these fowls and a duck were found dead and several more were ill. It is, of course, possible, that they may have found a few beans, but the poultryman assured me that they could not have done so, and I did not have time to autopsy them. Regarding the postmortem on the animals that died, the first one showed typical gastro-enteritis, every portion of the bowel being inflamed. Other organs appeared to me to be healthy.

"The postmortem examination of the horse at the second farm disclosed an inflamed stomach, and the mucous membrane of the small intestine was covered with a thin, yellow deposit which could not be removed by washing, but would rub off without difficulty.

The symptoms were as follows:

"In the first place, a rise of temperature appears to be constant in cases of poisoning with castor seeds. Usually it rises to about 103°, and the highest recorded here was 105.2°, about twenty-four hours after the food had been taken.

"In every case the pulse-rate rapidly increased. In every case it reached at least 72, and in several it was as high as 84 to 90. In every case that recovered the worst period was about twenty-eight hours after the consumption of the poison.

"Respiration was in some cases normal, but in others, even when there was no evidence of abdominal pain, it was somewhat hurried. This was especially noticeable in the two colts. Of course, when colicky symptoms appeared the breathing rapidly altered.

"In all cases that recovered the bowels were constipated, and 28 ounces of linseed oil had only very slight laxative effects. The two animals that died had received the same dose of linseed oil, and they were purging within twenty-four hours and died soon afterward.

"The feces were coated with mucous and passed in handfuls.

"Shivering was a constant symptom in early stages, but it passed off in a few hours.

"With regard to treatment, I may say that if I had a similar experience again I would use moderate doses of linseed oil and half-grain doses of arecolin (repeated if necessary) to remove the poison as rapidly as possible without purging. I should also give stimulating diuretics combined with strychnin during the fever period, followed by bitter tonics and sodium sulphate.

First Aid in Emergencies

"First Aid in Emergencies," by Dr. Eldridge L. Eliason,[1] is offered to the public not as a technical and a scientific treatise on the subject considered but as a help in emergencies that occur in everyday life. It was not written for physicians, but for the laity. It is not the province of this department to discuss the advisable treatment of such subjects as surgical principles, wounds, bleeding, heat and cold effects, sprains, unconscious condition, suffocation, medical emergencies, infections, transmissible diseases, etc., but rather to review the chapter on poisons.

A bit of advice in the book which it might be well for everyone to observe, is to send for the doctor immediately. The same advice might well be passed along to the farmer who has a sick animal to "send for a veterinarian." To illustrate, I have a case in mind. Some years ago in western Wisconsin some animals died and were buried, and no veterinarian was consulted. Three or four years later an outbreak of anthrax occurred on the same

[1] First Aid in Emergencies, 1-233 f. 1-106, J. B. Lippincott Company, Philadelphia.

farm, the evidence being that spores of the organism which formed in the animals were later washed down on the meadow lands below.

Chapter IX of the Eliason book is devoted to poisons. He states that poisons vary greatly in the symptoms that they cause, especially in their action in the first stages, but almost all of them give more or less similar systoms of depressions of mentality, heart, breathing, etc. He classifies poisons into four varieties: (1) general poisons, belladonna, strychnine; (2) local poisons, acids and alkalies; (3) general poisons, causing also local irritation, mercury, iron, arsenic; (4) sleeping poisons, opium and chloral.

The antidotes and treatment are given for the various poisons, so far as they are known. The author then describes some twenty-four poisonous plants, based on the list of Chesnut of the United States Department of Agriculture, such plants as poisonous hemlock, cowbane, poison ivy, larkspur, jimson weed, loco weed, cherry, corn cockle, are described and in some cases illustrated. The subject is concisely treated, a description of the plant, symptoms of poisoning, and in some cases treatment is suggested. It is one of those useful books that should be in the library of the veterinarian as well as the layman.

Poisoning From Andromeda Floribunda

Henry Taylor calls attention to an unusual case of poisoning in a female pedigree goat caused by *Andromeda floribunda*.[1] "The symptoms presented were: Great weakness, depression, loss of appetite and straining as if in labor. The attendant, who had had several years' experience with goats, said that shortly before my visit the goat had been sick and brought up some watery fluid—a thing he had never observed in goats before. On making a vaginal examination the os uteri was found not to be at all dilated. This examination was made because of the obvious straining and the knowledge that the period of gestation was about at an end.

"As the symptoms of vomiting in ruminants are almost always associated with the ingestion of evergreen shrubs, poisoning by rhododendron was suspected, but the attendant remarked that poisoning was out of the question, as the animal had been turned out only in the yard for several days past.

"The next morning the goat was unable to stand, the vomiting was more or less constant. After a preliminary retch a quantity of green fluid mixed with ingesta would be ejected. Prostration was very marked and there was a good deal of straining.

[1]Veterinary Record. London, 30: 335.

Chenopodium Oil

This oil which is much used in hog remedies may in some case prove injurious. Mr. C. Hall and H. C. Hamilton state as follows:[1]

"Oil of chenopodium is an unusually valuable and potent anthelmintic, but, like practically all potent anthelmintics it exerts an injurious action on the host animal to some extent, an action which is usually very slight, but sometimes severe. This undesirable effect has been noted by Rose in the following terms: Alarming symptoms, and sometimes death have been reported in the Southern States, the West Indian colonies, Panama, Nicaragua, Ceylon, and Egypt, following the administration of the drug in accordance with accepted methods of treatment, and in nearly every instance in less than the maximum dose. Extreme caution in the use of the drug is therefore indicated until its proper method of preparation has been learned, its chemical composition and stability standardized, and a safe dosage and method of administration established.

"As one of us has noted elsewhere, the injury to a patient probably depends partly on the rate of absorption in the digestive tract, and the other the more remote irritant and toxic systemic effects on the circultory, respiratory, excretory and nervous systems."

They conclude their exhaustive investigation as follows: "The experiments here noted appear to warrant the following conclusions: That oil of chenopodium as ordinarily marketed is a very potent and valuable anthelmintic, but that it not infrequently acts as a gastro-intestinal irritant, a fact that seems to have been commonly

[1]Jour. Pharmacol. & Therap., 11: 231-261.

overlooked, disregarded or allowed to go unstated, although noted years ago by Bruning and of late years by Salant and Nelson; that the gastro-intestinal irritation seems to be due to constituents making up a fourth, or less, of the volume of the oil and constituting the undistilled fraction when the lighter boiling constituents are distilled over at temperatures up to 125° C. with a pressure equal to 30 mm. of mercury, or at equivalent temperatures and pressures; and that the use of the lighter fraction as an anthelmintic in preference to the entire oil, in order to protect the patient from gastro-intestinal irritation, is apparently indicated.

Mechanical Poisons

A number of plants are said to be acrid poisons. In some cases this is undoubtedly traceable to the crystals of calcium oxalate. E. D. Brown and D. D. Anderson[1] made an investigation of a number of plants like the Indian turnip, colocasia, etc. In regard to poke root they found that:

"Microscopic examination shows the presence of acicular crystals in large numbers which are shorter and thicker than those found in the arum or colocasia. The fresh dried and boiled root gave a tingling sensation to the tongue but not nearly as marked as the arum. I am informed that men employed in drug-milling plants experience severe and distressing symptoms when this drug is ground. The mucous membranes are extensively involved in some cases causing total incapacity for work for a period of several days. That the condition is in all probability due to the crystals is shown by the fact that the sputum is loaded with the crystals and the bronchial symptoms clear up as the crystals disappear.

"The degree of so-called acridity is governed by the physical character of the crystals and the character of the plant tissues in which they are embedded, those plants containing the long, very slender crystals being much more acrid than those where the crystals are shorter and thicker.

"As for the loss of acridity in the arum after drying or boiling, this can be explained by the fact that the crystals in the arum are not inclined to occur in bundles as in the others, and in the shrinking due to drying they become broken by unequal pressure along their body.

[1]Jour. Pharmacol. & Exp. Therap., 12: 37-42, 1919.

Black Disease

Dr. Sidney Dodd of the Veterinary Research laboratory of New South Wales,[1] gives an account of this troublesome disease which has been known for more than fifty years in the southern highlands of New South Wales. Mr. M. S. Pottie in 1895 suggested that the disease be called braxy because of its resemblance to the European disease known by that name. It appears from the investigation that "The principal result of the work performed during 1914 was the isolation of an organism that was morphologically and culturally of the braxy type, and which was fatal when inoculated subcutaneously in small doses into guinea pigs, but not to rabbits.

"Administration of the organism per os in large and daily doses to sheep produced no apparent result.

"The point which immediately attracts attention is the striking difference between the results obtained in 1914, and related in Part I, of this communication, and those obtained during subsequent seasons. In the former case the animals from which the materials for experimental work had been obtained were not seen alive, but had been dead an unknown, although not very long period, at the most only a matter of a few hours and during a cold season of the year. In the latter case the animals were seen alive, and the materials were taken from them immediately after death occurring naturally or from killing.

"In the case of sheep found dead of black disease, certain bacteria could in most instances be demonstrated microscopically in the blood, exudates, and organs, the number depending upon the length of time the animal had been dead. In the congested areas in the stomach, intestines, and liver, sections also showed fewer or larger numbers of bacteria, often apparently of only one species. The commonest organisms were a bacillus morphologically of the braxy type, and a bacillus of the malignant edematic type.

[1]Journal of Comparative Pathology & Therapeutics, 31: 1-35.

"Various explanations have been advanced as to the cause of the disease in sheep known as black disease. They may be grouped under four chief headings: bacteria, plant poisoning, a deficiency disease or absence of vitamine, a filtrable virus.

"The instances in which bacteria have been demonstrated to have been present before death are too few when compared with those in which none were found, to permit of any generalization with regard to their etiological importance. In spite of this, however, it is quite possible that the cause is bacterial, but that the organisms are confined to the lesions, or to the intestinal tract, whence a very powerful toxin is given off. Unfortunately, however, up to the present, examination of sections from the lesions has failed to reveal any bacteria which can be said to play a causative role in the disease under consideration.

"Although, as has been remarked, the indications are that the cause of black disease is probably bacterial, this has not caused one to shut one's eyes to other possible causes. The next possibility, and the one held by the majority of stock owners concerned, was plant poisoning. During the whole period of field investigations I have endeavored to find plants which were common to the various localities in which the disease had occurred, and also what plants had been eaten in these areas.

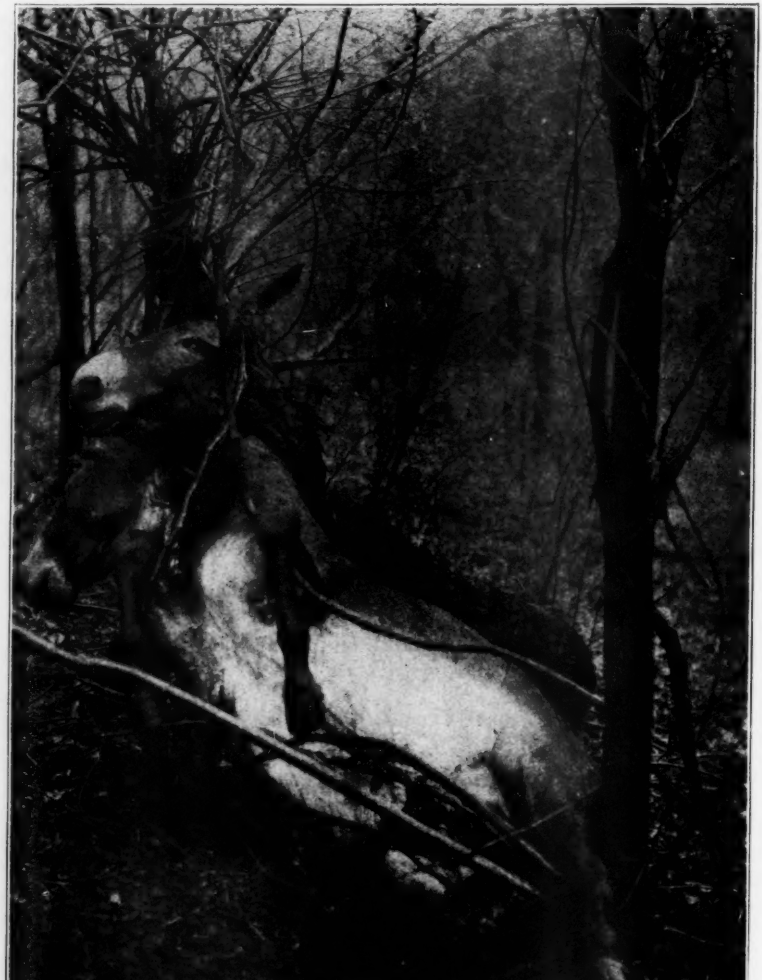
"In one district many stock owners firmly hold the view that the common water-cress, which grows abundantly in the small water courses, is the cause of the trouble. In order to settle the question definitely six sheep were fed for a fortnight upon fresh water-cress. The result was negative. One is quite prepared to admit, however, that the water-cress hypothesis may be an instance of correct observation, but wrong deduction, i. e., the cause of the disease may be present more particularly in the wet situations where water-cress grows so abundantly.

"The third theory, viz., that the condition is a deprivation or deficiency disease, due to the absence of a vitamine in the food, and that the lesions resemble those of 'wet' beri-beri in the human being, appears to have been arrived at, not from any direct evidence, but mainly because a tangible cause has not yet been demonstrated. It is not wise nowadays to dismiss any hypothesis because it is strange or does not fit in with one's own views: but there are factors in connection with black disease which, although ignored in the 'deprivation' theory, need to be explained away if the latter is to receive more than academic attention. Some of these factors are the following:

"The considerable annual variations in the incidence of the disease. During the season of 1915 losses were very heavy. This, as I have suggested elsewhere, may have been partly due to drought conditions: but in 1916 (a good season for

These happy, healthy kiddies, Dorothy and George Fox, children of Dr. D. A. Fox, Winn, Michigan, take great interest in "Daddies" work, which is reflected in their fondness for animals. They are proud of their pets, two of which are shown in the picture.

feed) they were again heavy although not so great as in the preceding season. On the other hand, during the past season of 1917, when losses were heavy in sheep from parasitic troubles, the disease has been practically nonexistent."



Entangled in a wild grape vine, these mules were found dead in the above position by the owner. Since, as is well known, mules are as playful as kittens, it is believed that in a friendly frolic (or, mayhap, in an angry fight) they became entangled in the vine, strangulation finally ending their struggles.—Photo by Dr. D. B. Morgan. Neosho, Mo.

Queries and Answers

Cause and Remedy for Bitter Milk

Be kind enough to tell me what you think is wrong with this cow.

Since last October she has, to all appearances, been in good health and milking plentifully. In using the milk, nothing seems wrong until the cream is soured to make butter. Neither the butter nor the buttermilk can be used on account of the bitterness.

I might add the feed has been changed several times, with no improvement in the quality of the milk. There is no induration of the udder.—H. B. P., Mo.

REPLY: There are four conditions that give rise to a bitter taste in milk:

First, this is somewhat common in cows near the end of the lactation period and occasionally occurs during the estral period.

Second, when warm milk is allowed to cool in an unclean barn, certain odors and tastes are sometimes absorbed from the air in the barn that make the milk repulsive.

Third, occasionally bitter principles are eliminated in the milk of cattle fed on certain feeds. An example of feed flavoring the milk is seen when cattle eat garlic or wild onions and, under some conditions, alfalfa.

Fourth, the action of bacteria.

In the first three cases, the milk is bitter from the beginning. In cases where the milk is not bitter for some hours or days after it is drawn, the bitterness is due to the action of bacteria. Sometimes these bacteria have their source in the udder, a non-pathogenic invasion. Usually, however, they get into the milk during milking. This is common with cows fed musty or moldy feeds or when moldy straw is used for bedding.

When the trouble has its source in the udder it is difficult to correct and is quite apt to persist during the lactation period, but to disappear when lactation ceases. The latter, the common type, can be eliminated by removing the cause. Disinfect the barn. The use of covered milk pails might assist in preventing the contamination of the milk during milking, or heat and hold the milk for five minutes at about 160 to 170° F. Ordinary pasteurization is not sufficient, since these organisms are more resistant than the ordinary disease producers.

STOMATITIS OF OBSCURE ORIGIN

I have had several cases of swollen tongue in cattle, mostly one and two years old, on pasture. They have not responded to treatment, and I wonder if any other practitioner has had the same trouble. In two cases the swellings appeared to point and I opened them, but there was no discharge, no dark, bloody fluid. The entire tongue was thickened. I suspected actinomycosis and administered potassium iodid. They did not improve much and do not put on flesh, but the tongue is not so swollen. Where was I wrong?—R. C. B., Iowa.

REPLY: Actinomycosis of the tongue (woody tongue) is by no means rare. The symptoms that you mention fit attacks of this kind. The animals could not be expected to improve in flesh during the time the potassium iodid was being administered, or for some time afterward. In fact, they would probably lose flesh.

At this season of the year, October 1st, a stomatitis due to rough forage or to prickly material and perhaps also to molds is to be thought of.

On the other hand, the condition you mention may be neither actinomycosis nor stomatitis due to the ingestion of irritant matters, but a purely local condition. We recall hearing of several stable-fed animals developing soreness and swelling in the mouth and along the esophagus. After a time an abscess developed in one of these animals in about the middle of the cervical

region. On opening the abscess, some steel shavings were found. The feed these animals were receiving was sifted, and over a half bushel of steel shavings was obtained from less than a carload of feed.

A PINT OF PARAFFIN OIL INSUFFICIENT IN COLIC

I had a peculiar case of colic on which I would like to have some information.

I was called to treat a young mare of about five years of age, that had colicky symptoms. I administered a purgative and when I left the farm, the peristaltic action was very good and the mare was resting easy.

Two days later I was called again. There had been no results from the purgative I had given, so I drenched the mare with one pint of paraffin oil and gave rectal injections of warm water soap suds.

Her temperature was 102° F. She would neither eat nor drink. She made several unsuccessful attempts to evacuate. I removed all feces possible, which were very soft.

I was called again three days later, the owner saying the mare was no better. When I arrived, her temperature was 101.8° F., and still no bowel movement. Peristaltic action was fairly good; with pulse strong, and the mare appeared bright, but would not eat or drink. I left one quart of paraffin oil, with some nux vomica, to be given about every four hours. I also instructed my client to give rectal injections often. Rectal examination showed the feces to be very soft.

My client said he would call me again if the mare got worse, but not having heard from him, I take it for granted that the patient survived.

Do you think I gave this mare the proper treatment?—A. A. A., Wis.

REPLY BY DR. L. A. MERRILLAT: This seems to be a plain case of constipation that might have yielded to treatment a little more promptly if a larger dose of purgative medicine had been administered. A pint of paraffin oil is insufficient in such cases. Two to three pints of linseed oil with occasional hypodermic injections of strychnin, walking exercise and repeated enemas would have brought this case to a favorable termination in thirty-six hours.

EARLY SYMPTOMS OF FORAGE POISONING RESEMBLING AZOTURIA

On February 23, I was called to attend a case, the history and symptoms of which were as follows:

History: A 1,700 pound stallion was fed heavily for over a week, and given little exercise. On February 23, he was to be brought to town. On the morning of that day, he was apparently well and ate his feed. About ten A. M., as he was about to start for town, he was staggering and showing weakness.

Symptoms: Temperature normal, pulse weak and respiration accelerated. Appetite good and mucous membranes petechiated. The animal became excitable and stiff, exhibiting incoordination of locomotion. As the disease progressed, the eyes became lusterless and the head was turned toward the left while the membrane nictitans partly covered the right eye. The urine had been normal in color and appetite good.

My diagnosis was cryptogenic or forage poisoning. I treated the animal by giving a purgative followed by potassium iodid alternated with Fowler's solution, fluid extract of nux vomica and fluid ounce of gentian. On the fourth day, the animal shows slight improvement.

Is my diagnosis correct and treatment rational?—P. C., South Dakota.

REPLY: Yes.

TOTAL ABLATION ONLY REMEDY FOR SHOE BOILS

I have a client who has a horse with a shoe boil which he says is about as large as his two fists and very hard. He has blistered it; opened it and injected iodin into it, without appreciable results. It has been troubling the animal about four years.

What treatment would you advise? He lives a long way out, so I would not be able to attend to it regularly.—P. L., Colo.

REPLY: There is but one effectual and satisfactory procedure against shoe boils of this character and that is ablation. The longer the operation is postponed the worse for the patient. The application of ab-

sorbents has never in my experience cured a shoe boil. On the contrary, it seems always to aggravate them. Shoe boils always diminish in size when the cause is removed over a more or less prolonged period, and under such circumstances local applications often receive credit not due them.

The querist is advised to make a careful subcutaneous dissection of the growth, bring the edges of the skin-flaps together and then keep the patient standing not less than twenty-five days to prevent mechanical injury to the wound.

The procedure that has always pleased us most is that of pinching the growth tightly around the base with an ecrasure or in lieu thereof with a common twitch; then making the dissection without sacrificing very much skin. Before closing it is important to carefully and very patiently arrest the bleeding. Otherwise the traumatic cavity will fill with blood and materially mitigate against ultimate recovery. The sutures should be strong but not taut. Two or three, through-and-through, crucial sutures are first inserted to bring and retain the flaps loosely together and then the edges are neatly approximated with common interrupted sutures. A small aperture below is left for drainage, and care is taken during the first week to keep it freely open.—L. A. M.

TAPEWORMS IN LAMBS A SERIOUS MATTER

I am having a great deal of trouble with lambs in this locality. The symptoms are: coughing, discharge from the nose and eyes, weakness and loss of appetite. Autopsy reveals a considerable infestation with tapeworms, ten to fifteen feet long. Frequently a pint and sometimes two pints of these worms are found in the small intestines of a single lamb.

Still, as tapeworms are by no means uncommon in apparently healthy lambs, I hesitate to charge them with the trouble in these herds. I have used hemorrhagic septicemia bacterins quite extensively with only fair success. In some herds the results seemed good. In others, I could see no effect from the bacterins.—F. G., Iowa.

REPLY BY DR. E. T. BAKER: From your description, I am inclined to incriminate the taenia. A colony of thriving tapeworms bulking up to one or two pints and increasing all the time is certainly a serious handicap to a growing lamb, and may well lead to troubles of just the sort you are describing, and I should be inclined to eliminate them first.

For this purpose, I have had fine success with 45 grains of ethereal extract of male fern in two ounces of mineral oil, given in the morning an hour or so before feeding, and repeated for four consecutive days; that is, giving five such doses. The dose should be doubled or tripled for sheep. Explain to your client the great difficulty of ridding sheep of tapeworms, and secure his full cooperation if possible. A complete change of pasture and corrals is essential, as is also keeping dogs away from the flock.

STATE VETERINARIANS IN NORTHWESTERN STATES

Please give me the names and addresses of the state veterinarians of Washington, Oregon, Idaho, Montana, Wyoming, Nevada and Utah.

REPLY: Dr. S. B. Nelson, Pullman, Wash.; Dr. W. H. Lytle, Salem, Oregon; Dr. J. D. Adams, Boise, Idaho; Dr. W. J. Butler, Helena, Mont.; Dr. B. F. Davis, Cheyenne, Wyo.; Dr. Edward Records, Reno, Nev.; Dr. R. W. Hoggan, Salt Lake City, Utah.

STATES HAVING NO VETERINARY PRACTICE LAW

I am tired of the cold winters in Wisconsin and before we have another, want to move to a milder climate. It has been more than twenty years since I left school, and I have misgivings about taking an up-to-date examination. Please let me know what states have no veterinary practice laws and some good locations in each.—F. X., Wisconsin.

REPLY: There are laws regulating veterinary practice in all of the states now, except Arizona, Florida, New Mexico and South Carolina.

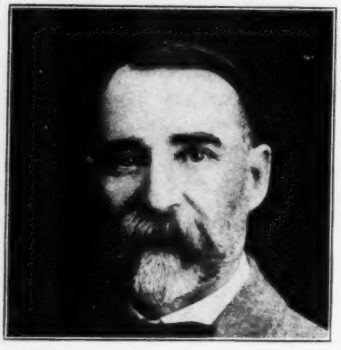
It is difficult to give you information. regarding good locations. Communities that might offer a good opening now may be supplied by next fall. A community sup-

plied at this time may be in need of a veterinarian by that time. When you decide to move, write the state veterinarian of the state in which you wish to locate for information. The state veterinarians of the foregoing states are: Dr. R. J. Hight, State Veterinarian, Phoenix, Ariz.; Dr. J. W. DeMilly, State Veterinarian, Talahassee, Fla.; Dr. M. R. Blackstock, State Veterinarian, Spartanburg, S. Car.

WHAT STATE BOARDS ARE THE EASIEST?

I contemplate a change of location. What state boards of veterinary examiners give the easiest examinations?—D. W. G., Iowa.

REPLY: We wouldn't tell if we knew. We will say, though, that the Illinois, California, New York, Minnesota and Ohio boards are reputed to be the hardest ones to "get by," in the order named, beginning with Illinois, where something like three-fourths of those who have taken the examination in recent years have failed.



Dr. J. L. Tyler, Pomona, Cal., Secretary State Board of Veterinary Medical Examiners.

REGISTERING WITHOUT AN EXAMINATION

1. In what states can a man engage in veterinary practice without a license?

2. In what states can a graduate register without an examination?

3. Who is secretary of the state board of examiners of Texas, Oklahoma, California and Nevada?

4. Are there good openings in these states?—F. K., Kans.

REPLY: 1. See reply to F. X., Wisconsin.

2. In most states this is optional with the examining board, and depends upon the school from which one is graduated and other regulations of the board at the time. Such regulations change frequently and for up-to-date information on the subject, you should address the secretary of the examining board of the state in which you are interested.

3. Dr. F. E. Barnes, Waxahachie, Tex.; Dr. W. F. Pryor, Wewoka, Okla.; Dr Jno. L. Tyler, Pomona, Calif.; Dr. Robt. Dill, Reno, Nexada.

4. Address the state veterinarian of each state. Their names and addresses are: Dr. E. M. Wiggs, 506 Flatiron Bldg., Ft. Worth, Texas; Dr. E. V. Robnett, Oklahoma City, Okla.; Dr. Charles Keane, Sacramento, Calif.; Dr. Edward Records, care of Univ. of Nevada, Reno, Nevada.

INTERSTATE SHIPMENT

Is the intradermal tuberculin test accepted for the interstate shipment of cattle?—J. W. W., Ind.

REPLY: The interstate shipment of cattle is subject to regulations of the United States Department of Agriculture and of the state to which the cattle are going. The United States regulations provide that certificates for interstate shipment of cattle for other than immediate slaughter may be issued only by veterinarians authorized to make tuberculin tests for such purpose by the Chief of the Bureau of Animal Industry, on the recommendation of the live-stock sanitary authority of the state in which the veterinarian lives.

An intradermal tuberculin test made by one of these authorized veterinarians is accepted for interstate shipment of cattle when this test is acceptable to the live stock sanitary authority of the state of destination of the shipment.

Since state regulations change from time to time, you should make certain whether or not the state to which your shipment is going will accept the intradermal test.

Interstate shipment is governed by United States Bureau of Animal Industry Regulation No. 7, which is given elsewhere in this issue.

DEPARTMENT OF

SWINE PRACTICE

Edited by A. T. KINSLEY, M. Sc., D. V. S.

Contagious abortion in swine is becoming wide spread, and during the past year has taken a heavy toll of pigs in several states, in some sections as high as thirty per cent of the pig crop. Little is known concerning it, and it is important that investigations be pushed as rapidly as possible. I will appreciate it very much if readers will send me aborted pigs (one from a litter). It is essential that these pigs be packed in borax and shipped within a few hours of birth, otherwise decomposition will interfere with the laboratory and cultural examination. Send pigs from all aborted litters whether the abortion be due to infection or other causes. Mail such history as is available when the pig is shipped. Address correspondence and ship specimens to Dr. A. T. Kinsley, New Center Building, Kansas City, Mo. You will be promptly advised as to our finding with any suggestion we can give regarding your cases. Reports of our findings will be published from time to time in these pages.

Abortion in Sows

I would like some information in regard to a condition existing in our swine herds in this locality. The sows are aborting, as many as eight aborting in one herd. Otherwise, they are well; they eat and move around and some of them come in estrum three days after aborting.

Is this infectious abortion in swine or what is it?—C. J. B., Ill.

REPLY by DR. A. T. KINSLEY: There seems to be no question that infectious abortion exists in swine. This disease, in fact, is very prevalent. The specific cause has not been identified, though investigators are now busily engaged in searching for specific causes. Our advice thus far has been to isolate all aborting sows, exert every precaution possible to prevent the dissemination of infection to other animals. Further than this, we have little to offer at the present time.

We are investigating this disease in so far as is possible, and would be pleased to have you send to us at any time the fetuses of recently aborting sows. Pack the fetuses in sufficient quantity of powdered borax and mail direct to me, New Centre Bldg., Kansas City, Mo. Send by parcel post, special delivery.

We shall be glad to hear from you further at any time.

HEMORRHAGIC SEPTICEMIA AND HOG CHOLERA COMBINED

I would be glad to have some suggestions regarding the hog trouble I am up against, the symptoms being somewhat as follows:

First, they have a hacking cough for a few days, then their ears begin to turn purple and they quit eating altogether. A raise of temperature from 4 to 7 degrees above normal is noted, and some are affected with diarrhea while others are constipated, the latter living longer than those with diarrhea. There is some discharge from the eyes but none from the nose. Convulsions are the first symptoms noted in one case out of five. These cases respond to a dose of bacterin in twenty-four hours and resume eating as though nothing had happened.

Postmortem shows all the digestive organs to be normal. The muscles seem to be slightly congested in some but not all cases.

Those that I call chronic cases become very poor in flesh and wither away to al-

most nothing. I have one pig that has just barely lived through the winter. The portions of his ears that were purple sloughed off, or rather dried up and fell off.

Last summer during the warmest weather the bacterin worked fine and saved them all; now they all die. The ventilation is poor and they are fed cooked garbage gathered up around town.

The symptoms you describe as hemorrhagic septicemia are identical with the symptoms shown in these cases, but I feared it was hog cholera in a form I was not acquainted with.—C. A. C., N. H.

REPLY: From your description of the rise of temperature and the changes following that occur in the pigs, I fear that you are dealing not only with hemorrhagic septicemia but a low grade of hog cholera in which virus has been partially attenuated or the hogs have an increased resistance to this virus. In my judgment you would have best results by triple immunization, using anti-hog cholera serum and virus and swine plague bacterin.—A. T. K.

IMMUNITY AGAINST HEMORRHAGIC SEPTICEMIA OF SWINE ONLY TEMPORARY

How long an immunity can be conferred by the use of hemorrhagic septicemia vaccine in hogs? I ask because we have recently had a severe outbreak of this disease and almost every owner wants to know if he can have his hogs vaccinated and a permanent immunity conferred, such as is afforded against cholera by the use of serum and virus.—M. R. P.

REPLY: According to the reports available it seems probable that the immunity conferred by the use of hemorrhagic septicemia bacterin in hogs is from three to six weeks' duration. These conclusions have been obtained largely from the investigation of shipments of stock hogs that had been immunized at the time of purchase in the public stockyards with swine-plague bacterin.

In many of these instances, after the course of three or four weeks, particularly during bad weather, this disease has appeared in the herd. In such cases it is usually efficiently controlled by reimmunization. In fact, some veterinarians immunizing hogs in public markets are now recommending that the hogs be given a second injection one week after leaving the yards. —A. T. K.

PROBABLY AUTOTOXEMIA OR A PARASITISM

I would like to have information concerning an ailment of hogs showing the following symptoms:

When they first come out of their nest they stagger, fall down, have spasms or fits, tip over backward, lay there exhausted, get up, go to the trough and eat and are all right. It may be a week before they have another spell.

Some of these hogs on postmortem examination show hyperemia of the lungs. The bowels seem in perfect condition. This points to worm infestation, but I found only three or four worms in each hog.

My treatment has been purgatives of salts to effect, followed by iodin and formin, with no benefit.—L. L. M., Mich.

REPLY: A more detailed description of the condition existing in the hogs seems necessary to make a diagnosis or prescribe treatment. We would want to know the size of the hogs that are affected with spasms and convulsions, the kind of feed stuff they have been receiving and the surroundings in which they are kept.

Generally such conditions are the result of absorption of injurious chemical substances, either as a result of feeding improper feed or moldy feed. Another very important cause of such conditions is parasitism, and we are led to believe, from the statements made, that on autopsy practically no parasites were found. It is probable that if these hogs are put on a vermifuge powder that can be readily mixed with their feed and the feed is of good quality, that no further trouble will arise.—A. T. K.

Dr. G. P. Cooper, salesman for the Lederle Antitoxin Laboratories, formerly connected with the Kansas City branch, has been transferred to the Chicago branch, which is located in the Marshall Field Annex Building, from which point he will cover the Illinois territory.

List to Date of Dosage of Drugs for Adult Fowls

By Dr. B. F. Kaupp, Pathologist

Name of drug.	Lethal dose.	Maximum dose.	Minimum dose.
Quinine sulph. and bisulph.		3 grains	1 grain
Ferrous sulphate		30 grains	10 grains
Carbo ligni		10 grains	5 grains
Phenol	4 grains	2 grains	0.5 grain
Magnes. sulph.		1 dram	0.5 dram
Pott. dichromate and permang.	30 grains	15 grains	2 grains
Sodium chloride	2.5 drams	1 dram	0.5 dram
Thymol		3 grains	0.5 grain
Calcium phos. precip.	1.25 drams	0.5 dram	0.25 dram
Potass. chlorate, sulphite and iodid.		1/20 grain	1/40 grain
Sodium bicarb.		20 grains	10 grains
Ferrous oxide		5 grains	1 grain
Mercury bichloride	4 grains	1 grain	1/10 grain
Potass. tartrate		10 grains	5 grains
Oil turpentine		1 dram	0.5 dram
Sulphur		5 grains	2 grains
Mustard		10 grains	5 grains
Nux vomica	1 ounce	2 drams	0.1 dram
Gentian		4 drams	0.2 dram
Ginger		5 drams	0.3 dram
Wormseed oil		10 minims	5 minims
Capsicum		5 grains	1 grain
Anise		⅓ grain	1 grain
Quassia		⅛ grain	1/16 grain
Strychnine sulph.	1 grain	¼ grain	1/6 grain
Aloin		2 grains	1 grain
Ammonia carb.		20 grains	10 grains
Areca nut		10 grains	5 grains
Belladonna F. E.		10 minims	5 minims
Castor oil		1 tablesp'nful	1 teasp'nful
Convallaria F. E.		20 minims	10 minims
Digitalis F. E.		20 minims	10 minims
Calomel		10 grains	5 grains
Podophyllin		½ grain	¼ grain
Santonin		½ grain	¼ grain
Sulphocarbolate of calcium		½ grain	¼ grain
Sulphocarbolate of zinc		½ grain	¼ grain
Sulphocarbolate of sodium		½ grain	¼ grain

The foregoing is taken from the second edition of Prof. Kaupp's "Poultry Diseases." This is the most complete list of poultry remedies and dosage that has been worked out by anyone, and is just a sample of the many valuable things in this work that are not available elsewhere.—Editor.

VETERINARIAN WANTED IN WEST VIRGINIA

The members of our Farm Bureau have requested me to try to get a *good* veterinarian to locate in this country. I am writing to ask if you can tell us of one. This is a most excellent field. It is a live stock country, and a good man can make a mighty fine thing of it. There is no one within twenty miles of here anyway you take it. One man sent forty-two miles for a veterinarian last week.

What we need is a good graduate, a good mixer, a hustler, and one who will not spend all his time looking for "moonshine." The last two men who located here have been "quacks." We don't want that kind.

A. G. Middleton,
County Agent.

Petersburg, W. Va.

MAKING CATTLE ENVIRONMENT FREE FROM INFECTIVE TUBERCULOUS MATERIAL*

The conditions under, and the influence to which tubercle bacilli from tuberculous cattle are exposed outside of the animal body are many, and, in our experiments it has been our aim to represent the most important of such, especially as they obtain in California.

In two series of experiments Traum has found that, when tubercle bacilli from lungs of infected cattle were exposed in a one inch thickness of manure on the ground, they were alive, in one series, at the end of 140 days and, in the other, at 71 days. In the first series, they were dead at 171 days and in the second at 94 days.

Tubercle bacilli, exposed in the first series, retained their virulence for guinea pigs for over two months longer than those in the second series under practically the same conditions. These results are in accord with the findings in our other experiments. The facts to bear in mind are that the two experiments were planted two months apart and that in both cases the tuberculous material became innocuous soon after the rains stopped, when they were no longer kept moist. There appeared to have been very little weakening of the tubercle bacilli during the rainy season.

A third series was carried out to determine how long tubercle bacilli would live when exposed to California climatic influences when no rains intervened and to what extent cattle would become infected with such materials. Seventeen days after being placed in the experiment plot, tuberculous material exposed in one and one-half inch thickness of manure was no longer able to produce tuberculosis in either guinea pigs or in cattle. The guinea pigs were given direct inoculations, while the cattle were exposed in a small pen and forced to be in a cloud of dried tuberculous matter for an hour on each of two successive days and were also fed hay thoroughly mixed with the dried tuberculous material.

In water holes, on the other hand, we find 687 days after exposure in one experiment and 548 days after exposure in a second, that the tuberculous material is still capable of producing tuberculosis in guinea pigs when inoculated. The end point in the first experiment was apparently reached.

In the case of exposure of tuberculous material when kept moist as in a water hole, it was deemed necessary to determine to what extent the cattle would become infected when exposed to such material. We found that all of three cattle became tuberculous when forced to drink water taken from water holes ninety-eight days after such holes were infected with tuberculous material. The end point in this experiment was not yet reached. All of six cattle exposed earlier in the experiment also became infected.

The practical significance of these findings is very evident, namely:

Environs contaminated with tuberculous discharges from cattle become free from such infective materials soon after the media in which they are contained are freed from sensible moisture. On the other hand, tubercle bacilli that are found in water holes, mud holes and watering troughs retain their virulence for a considerable length of time.

*Report, University of California Experiment Station.

INFECTIOUS OPHTHALMIA IN THE A. E. F.

Today we are confronted at every turn with vaccines, bacterins and serums, used as diagnostic agents, prophylaxis and curative, some of which are par-excellent and acknowledged by all. Yet there are new fields unexplored, some of which are real stumbling stones for the average practitioner.

Probably one of the worst is "constitutional or periodic ophthalmia", at least the majority are ignorant as to its cause and treatment. Many theories have been advanced but none wholly satisfactory.

While with the 132nd Infantry in Italy, we had an outbreak of ophthalmia that was infectious, without a doubt. We are continually coming in contact with this malady in our practice and horses are continually going blind, in spite of treatment.

Will those who have had any success in the treatment of this ailment discuss it in the Journal? There are many of us who want any worthwhile information on this subject we can get.

Boswell, Ind. R. F. SMITH.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

Mammitis

THE cow shown in the illustration was observed at the Union Stockyards at Chicago in a pen with a number of other cows. Attention was drawn to her, because of her standing in a corner by herself while the other cows in the pen were lined up at the manger greedily eating hay. She presented a down-cast appearance: ears drooped; flanks tucked up and half-standing out. Examination revealed a peracute case of parenchymatous mammitis; temperature 106° F.; pulse 80; respiration 30. No history available.

The cow was purchased and sent to the Chicago Veterinary College, where on the following day she was presented at the clinic and a careful examination made.

The patient was of the ordinary type of common grade dairy cow. The period of lactation was practically ended. Whether the udder was infected before, during, or after shipment could not be determined, but the causative organisms found seemed to indicate that the infection was contracted at the dairy before she was shipped.

The left hind quarter was greatly swollen; firm, hot and sensitive to touch; what little milk the quarter contained was thick with pus. The teat was thoroughly cleansed and a sample of pus drawn and sent to the pathological laboratory of the college. Dr. W. G. Keehn pronounced the infective organism, streptococci mastititis.

No treatment was administered and two more quarters became involved. The cow lost flesh rapidly, and six days after the date of purchase the photograph was taken As is shown, she exhibited all the symptoms of an advanced stage of toxemia. The temperature was 98° F.; pulse imperceptible; respiration shallow; she was very weak and walked with a staggering gait; ears drooped; eyes dull, and there was a muco-purulent discharge from the medial canthus. The general expression indicated near approaching death.

The cow was destroyed, and autopsy disclosed some interesting lesions, characteristic of such cases.

The entire udder was greatly congested, the three infected quarters were hard and their teats strutted. The cut surface indicated an ascending cirrhosis, beginning in the mucous membrane of the milk chan-

Cow affected with mammitis, exhibiting all the symptoms of the advanced stages of toxemia.

nels. The interstitial tissue was thickened, principally by coagulated lymph. The parenchymatous tissue was swollen and comparatively solid, and was somewhat shiny in appearance. The small sinuses and ducts were closed; numerous points of pus were observable, with here and there areas of extravasated blood. In the lactiferous sinus was a large gangrenous area on the mucous membrane, dark in color and foul-smelling. The mammary lymph-glands were in a state of acute inflammation and much swollen. The stomachs and intestines were comparatively empty. The spleen was enlarged and congested.

S. L. STEWART.

Chicago, Ill.

Section of quarter showing gangrenous areas and areas af suppuration (reduced one-half).—Dr. Stewart's case.

BAHNSEN PROCURES A STATE APPROPRIATION TO TEACH VACCINATION TO FARMERS

"An Act to amend an Act approved August 19, 1918 [by the Legislature of Georgia] entitled 'An Act to increase the appropriation for hog cholera control and for other purposes by providing that the state veterinarian shall cause experts to train persons in such counties as requested in this state to administer hog cholera serum and virus, providing an increase in the appropriation, and for other purposes.'

"Section 1. Be it enacted by the General Assembly of Georgia, and it is hereby enacted by authority of the same, That an Act approved August 19, 1918, entitled 'An Act to increase the appropriation for hog cholera control and for other purposes,' be and the same is hereby amended by striking out all of Section 2 of said Act and inserting in lieu thereof the following, to-wit:

"Section 2. Be it further enacted, That from and after the passage of this Act in order to meet the necessary demands to safeguard our rapidly increasing swine industry, the annual appropriation for hog cholera control be increased from ten thousand dollars to twenty thousand dollars. It shall be the duty of the state veterinarian upon request filed with him by the Commissioners of Roads and Revenues of any county or counties or by the ordinaries in counties which have no Commissioners of Roads and Revenues, to send into such county or counties an expert who shall instruct and train to proficiency in the proper and efficient use of hog cholera serum and virus, not less than four persons, to be residents of different sections of such county or counties. All persons so trained and qualified shall be issued a permit by the state veterinarian to administer hog cholera serum and virus; and it shall be the duty of all persons holding such permits and all licensed veterinarians to report daily, on blanks furnished by the state veterinarian, a full report on number of hogs inoculated, Federal License number and serial number of serum and virus used, the condition of the herd and any other information that may be necessary or helpful in the suppression of hog cholera. All persons holding such permits shall keep on hand a reasonable supply of serum and virus and shall supply same to farmers and swine growers at cost. Failure to make these reports and otherwise cooperate with the state veterinarian shall revoke the permit."

There appears to be nothing in the law to prohibit the farmers from purchasing their serum and virus from the state veterinarian.

CONDITIONS IN GREAT BRITAIN MUCH LIKE THOSE IN AMERICA

Under the head "Apathy Within the Profession," E. W. Hoare, F. R. C. V., editor of *The Veterinary News,* London, has the following to say concerning indifference of British veterinarians to the problems confronting the profession in that country:

"Several good men have of late endeavored to call attention to the general apathy within the profession, and we trust others will do their best to remove this alarming state, which is likely to retard all progress.

"But what is the cause of this condition which pervades every section of the profession? It cannot be due to a great struggle for existence, as veterinary surgeons were never before so well remunerated, and, in consequence of rapid transit by motor, never had so much time for reflection as they have now. Probably the root of the trouble is that too much time is given up to luxurious pleasure, which neither feeds the mind, nor brings grist to the mill, but nevertheless stupefies the activity of the intellect.

"There is no calling, if followed for the love of it, that can give so much food for reflection as the veterinary profession; it can give profitable pleasure to those who are inspired with enthusiasm. But where are the leaders imbued with that spirit of inspiring others? They neither exist in the army, nor in the schools, nor in the country practice. A nice state of affairs for a profession clamoring for more State recognition! It must make itself worthy of notice! It acts only from pressure from without, rarely, if ever, from pressure within. The *laisser-faire* policy is a dangerous one; it is not the one adopted in building up of great concerns; it is the one followed by those who do not make any progress.

"A correspondent writes: 'As to the general apathy of the profession, there can be no doubt. I attribute the blame to the teachers, who lack enthusiasm. Unless they show energy they should be retired at fifty years of age, but should receive a pension. The instruction students receive is on wrong lines. Pupilage in town and country should be made compulsory. Examinations should be abolished or curtailed. There should be only one school for the whole of the United Kingdom, and that one should be of the first order.'"

EVERSION OF VAGINA AND UTERUS.

Having read with interest reports of the above condition in a recent issue of the Journal, I will relate an experience I had with a case I was called to correct in a grade shorthorn.

The owner stated that he had called his regular veterinarian, and as he was ill he had sent his son, a medical student. This would-be veterinarian had decapitated the fetus; amputated one fore leg; and in the cadaver, I noticed one bold incision between the ribs. He had given a drench after delivery and left for other cases.

I found the cow down and making strenuous efforts to rise. Eversion of the uterus and vagina was clearly evident. I removed the retained secundines, which caused some hemorrhage and gave the parts a hurried antiseptic cleansing, as it was getting dark. A large breach was discovered in the uterus, necessitating possibly ten sutures (interrupted). My method in such cases is to close my hand and simply replace the parts—some job. No medicine was given. After adjusting retaining harness to prevent recurrence of the condition, I left.

The owner called at my office several days later and stated that the patient had a very poor appetite. I gave him one ounce of fluid extract nux vomica, with instructions to use two drams as a drench every three hours. A few days later, the owner informed me the cow was infested with maggots. I gave him a potent antiseptic to administer to the animal, and when I saw him a month later he said the animal was doing well.

The only reason I have for reporting this case is to show how desired results may sometimes be secured with simple remedies, as at first I thought this was a hopeless case.

W. D. Forsyth.

Oshawa, Can.

SIMPLE BUT EFFECTIVE HERNIA TECHNIC

The following is a crude but successful operation for the relief of hernia, especially umbilical hernia in colts from one day to three years of age. It perhaps is an old method known to the majority of older practitioners, but perhaps it may be new to some of the younger men.

The sizes of hernia I have encountered have varied in size from that of a walnut to the size of a man's head, and so far I have had no failures.

The instruments and appliances necessary are a table or casting harness, razor, scissors, suturing material, heavy linen preferably, antiseptic soap, tincture of iodin, antiseptic solution and receptacle, and regulation hernia clamps or two four-inch probes, pointed at one end, made of such materials as heavy telephone wire.

With the animal restrained in a dorso-recumbent position, the area immediately over and adjacent to the hernia is shaved, washed with antiseptic soap, dried and painted with iodin. Then with both hands properly cleansed, the intestinal loop which may protrude into the pouch, is replaced. By manipulation and gathering the folds in both hands, draw it away from the body so that the tenseness of the outside structures, skin, muscles and perhaps peritoneum prevents the intestinal loop from re-entering the sac.

The next step depends upon whether one uses the clamp or the pointed probes. I have used both but prefer the probes and use them in the majority of cases.

With the aid of an assistant, I insert the sterilized probes in opposite directions, through the center and as close as possible to the abdominal wall of the pedunculated fold which I have gathered and held.

The probes should be of sufficient length to project at least an inch on both sides of the tissues through which they have been inserted. The sharp points are bent away from the body to prevent any subsequent irritation. The linen thread is taken from the antiseptic solution and wound tightly four or five times around the base of the hernia between the crossed probes and the abdomen.

This completes the operation, and if the colt is kept in a small corral no further treatment is necessary, except cleansing the wound occasionally until sloughing occurs. It is then treated antiseptically until entirely healed.

Against my advice, some owners have turned colts out on the plains after this operation, and although they ran and jumped about no bad results followed.

Delano, Calif. D. R. Cook, D. V. M.

LIVING COLT DELIVERED AFTER INCISING THE CONSTRICTED CERVIX*

I was called June 5, 1916, to see a seven-year-old mare which the owner stated had been bleeding for two hours.

I found the mare in labor. The owner stated she had "gone" twelve months. After examining her, I found I could not dilate the cervix, and advised an operation, to which the owner agreed.

I opened up the cervix by cutting all the circular muscular bands on the upper side clear to the uterus, delivered her of a colt, and removed the placenta. The uterus involuted and there was no further hemorrhage, and both the mare and colt got along nicely.

B. L. Terrell.

Dresden, Tenn.

INTERPRETATION OF B. A. I. REGULATIONS

The accompanying outline arrangement of regulation No. 7 of the U. S. Bureau of Animal Industry to prevent the spread of tuberculosis in cattle, has been worked out by Dr. W. H. Lytle, state veterinarian of Oregon, for the use of veterinarians of his state.

This outline shows at a glance what is required by regulation No. 7, and we are certain will prove useful to all veterinarians. Much confusion has arisen over the meaning of this regulation, and not a few veterinarians have had their names removed from the list approved for testing animals for interstate shipment because they did not understand the requirements of regulation No. 7 or failed to carry them out. This outline should improve the general understanding of the regulations and facilitate the work of inspection for interstate shipment.

*Read before the Tennessee Veterinary Medical Association, Oct. 28, 1919.

B. A. I. REGULATION NO. 7.
For Interstate Movement of Healthy Cattle.

Cattle 6 months or over must be tuberculin tested except*

- 1c. Cattle from accredited herd, bureau cooperating with state, and found free from tuberculosis may be shipped interstate when covered by certificate issued by authorized state or federal veterinarian.
- 2c. Heifers under three years of age not having given birth to young cannot be shipped for feeding or grazing purposes unless certified to by owner that they will be used for no other purpose.
- 3c. Cattle consigned to public stockyards where federal inspection is maintained may be shipped or transported thereto without restriction.
- 4c. Steers and strictly range cattle may be shipped interstate without restriction.
- 5c. Bulls for feeding and female cattle other than heifers for feeding and grazing purposes only shall be covered by an affidavit of owner or shipper that they will not be used for other purposes.

Tuberculin Test

Who may make
1. Federal veterinarian.
2. Graduate veterinarian authorized by the State and approved by U. S. Bureau of Animal Industry.

Tests which may be used.

1. Subcutaneous Test
   1. Three pre-injection temperatures, 2 or 3 hours apart.
   2. Injection of tuberculin:
      1. 2 cc.'s Bureau tuberculin for calves 6 months to 1 year of age.
      2. 4 cc.'s for cattle more than 1 year up to maturity. Larger doses for old and repeatedly tested animals and clinical suspects. Other tuberculin in similar amounts.
   3. Not less than 7 post-injection temperatures, 2 hours apart, beginning not later than 8 hours after injection and continuing for a period not less than 20 hours after injection.
2. Intradermal Test
   - May be used when cattle are to be shipped to state which recognize this test. Observations must be made at the end of 72nd hour after injection, and if possible, should be supplemented by 48th and 96th hour observations.

B. A. I. REGULATION NO. 7.
For Interstate Shipment of Tuberculous Cattle.

Cannot Be Moved Interstate Except

1. Reactors for immediate slaughter
   - 1a. Moved to establishments or stockyards where federal inspection is maintained and there slaughtered.
   - 2a. Must be marked with letter "T" left jaw, not less than 2 nor more than 3 inches high, or punch out "T" left ear, 1 inch, and attach to left ear, tag, serial numbered, and words "U. S. B. A. I. Reactor."
   - 3a. Cattle must be accompanied by certificate issued by bureau or regularly employed state veterinary inspector engaged in cooperative tuberculosis eradication work, showing—
     1. Cattle have reacted to test.
     2. Permission to ship interstate.
     3. Purpose of shipment.
   - 4a. Transportation company must plainly write on waybill "Tuberculous Cattle," boat or car to be cleaned and disinfected.
   - 5a. Boat or car must be cleaned and disinfected at destination under federal supervision.
   - 6a. Cattle must not be shipped in cars containing healthy cattle or hogs unless latter are for slaughter.
2. Pure-bred cattle shipped interstate for breeding or feeding purposes reacting subsequently may be shipped interstate for purposes other than slaughter when—
   - 1b. Consigned to original owner at same point of origin.
   - 2b. Must be reshipped within 4 months from date original shipment.
   - 3b. Shall not be shipped in cars or boats containing healthy cattle or hogs.
   - 4b. Same as 3a.
   - 5b. Original and retest charts must be submitted to inspector who issued first certificate.
   - 6b. Same as 2a.
   - 7b. Same as 4a.
   - 8b. Can be shipped only to states which provide for segregation or quarantine until death or slaughter.
   - 9b. Cannot be again shipped except for immediate slaughter.
   - 10b. Same as 5a.

*Heifers, cows and bulls may be shipped only to such states that provide for accepting untested heifers, cows and bulls. Copies of certificates or affidavit by owners and shippers should be sent to state veterinarian of state of destination, to B. A. I., Inspector in Charge, T. B. Control Work, and State Veterinarian of shipping State.

TRAUMATIC PERICARDITIS CASES BUNCHED

A young Jersey cow, recently fresh, suddenly declined to eat grain, but ate hay. Examination showed no other symptoms of illness. A cathartic (saline) was administered with good results, but the patient continued to refuse to eat.

I asked for a consultation, but no diagnosis was made. However, we both were of the opinion that the trouble was possibly due to some foreign body in the stomach, or possibly to tuberculosis. We arranged to test for the latter, but the animal gradually grew worse and was destroyed.

Autopsy revealed four nails in the stomach (rumen) just beyond the entrance of the esophagus, two had pierced the wall.

There were no tubercular lesions. The patient never showed any evidence of pain, other than a jerky movement when she swallowed water.

I have two cases on hand at present which I believe are foreign bodies. I have been practicing only a short time, and it seems peculiar that I should have four cases of this kind at one time. None of these animals are fed mill feed, but simply grain and hay.

Nail puncture of the heart which caused the death of the animal.

I should like a reply from some brother practitioner who has had greater experience along these lines.

S. W. HAIGLER, D. V. M.

Bellflower, Ill.

DEATH RESULTS FROM NAIL PUNCTURE OF HEART

A grade shorthorn cow, 8 years old, was noticed by the owner to be, as he expressed it, "not exactly right." I saw her at midnight and she apparently was nearly normal with the exception of stomach symptoms, the contractions of the rumen being slower than normal and she was somewhat constipated. Some tenderness was shown in the region of the third stomach. I gave her a tablet, composed of barium chloride and tartar-emetic, and an hour later she was given a physic. Next morning, while the men were milking, the cow dropped dead as though shot. Postmortem disclosed that a finishing nail had punctured the heart and was held there by the muscular portion of the diaphragm. The third stomach just behind this portion of the heart, was enlarged four or five times its normal size, and no doubt forced the diaphragm and nail forward. No pericarditis was present and there was little fluid in the pericardial sac, except blood resulting from the nail puncturing the cardiac vein, as may be seen in the picture.

ESSENTIALS OF PRACTICE BUILDING

In reply to a letter asking an unusually successful practitioner what, in his opinion, had contributed most to his success, the following letter was received. It is worthy of study by every man who would like to see his practice grow and who desires to be held in greater esteem by his neighbors and fellow citizens.

"My wife has always maintained that success is two-thirds affability and one-third capability, and has constantly urged upon me the necessity of being more courteous toward people. This has been practically impossible for me, for I am not a "good mixer," and do not make friends readily, so it has not been affability. I think that I may also go further, and say that neither has it been exceptional ability.

"In so far as I have succeeded as a practitioner, I am willing to give special

thanks to my old preceptor. It was to him I came after a short six-months' term of school, as a very green student, with an exaggerated idea of my knowledge. It was he who so strongly impressed upon my mind that a successful veterinarian must always be a student, never allowing himself to get into a rut, and that when he ceased to learn he was already a 'dead one.'

"Naturally, one does not know just what features have caused men to employ him, and not the other fellow. We haven't their viewpoint. From my viewpoint, however, I feel that I have always given to my clientele *reasonably good*, but *always conscientious* service. I have always felt that when my family physician did not know what was the matter with a member of my family, that it was his duty to tell me frankly, and not 'stall around' about it until the patient was in a dangerous condition. I have always followed that practice with my patrons, and have yet to learn of the first instance wherein I have been the loser thereby. Many times consultation has cleared the matter up, and often by the following day the case was plain enough to any one. Even now, after 28 years of continuous practice, I am not ashamed to tell the owner that I am not just certain as to what is the matter with his animal.

"Added to this, when an owner has asked advice, and I knew I could do him no good, I have told him so, and have not taken his money for medicines to 'cure heaves,' 'take off spavins,' etc. Let them get such things from the fakers if they must, but never from us. I have never made extra trips just for the sake of running up a bigger bill. In fact, I feel that I have honestly tried to treat my patrons as I would want a veterinarian or family physician to treat me were the circumstances reversed.

"Now and then one hears some nice things said about him by some of his patrons, and it compensates in a great measure for some certain lines of service which we give to them that money can never adequately pay for. While I feel that I am rated a very good practitioner by the majority of my clientele, yet I am sure it is the confidence born of the above treatment of them, of which they would first speak, were you to ask them their opinion of me.

"I do not know whether or not the above covers the question as you desire. They are what I attribute the greatest measure of what success I have had to at any rate.'

AMERICAN VETERINARIAN IN THE LAND OF THE ARABIAN NIGHTS

Your letter of June 24th just to hand. I thank you for your kindness in remembering me. We appreciate letters from America—I can't tell you how much. I get my JOURNAL late, but it always turns up. We see strange things out here, but we all long to get home. Instead of that I have orders for Kurdistan—if you know where that is? It is several hundred miles north of here and it is a vast country of mountains with Kurds living up in the passes—they murdered two Englishmen, so now we are off up there to "strafe" them. Heavens only knows when we will get back—somebody is always starting a war. I hate the sight of sick and lame horses. When one does four hours each day of diagnosing lameness, month in and month out, one gets very fed up on it. The heat is intense here. I enclose a government weather chart.

The natives call this country "the white man's grave," and they are not far wrong. The Bubonic plague is the star killer here and smallpox claims second place. Excuse this awful paper, as there is so little out

"Lady Joe," favorite Holstein of Dr. H. J. McCartney of Joplin, Mo. She produces two pounds of butter a day.

here, we write on anything.

If it was not for the polo I get three times a week I should go mad with the monotony. The dates are getting ripe now. The many things that the Arab makes from the date tree is quite wonderful—he is a clever fellow. You would be astonished to see the big boats that he makes out of rough tree branches and old boards and sails them way out into the Persian Gulf.

THEODORE B. DOLL,
Captain, R. A. V. C.

Advance Base,
Bagdad.

[The day's maximum temperature shown in the *Bagdad Times* enclosed by Captain Doll was 118.7°F. and there is no mention that it was other than ordinary weather.—ED.]

ESTABLISHING THYROID FUNCTION THE ESSENTIAL IN TREATING GOITER

Many years ago I observed if I injected into an animal or human affected with an abnormal functioning thyroid gland, or so-called hypo or hyperthyroidism or goiter, a blood-serum made from an animal affected with an inefficiency of the parathyroid glands, that said human or animal readily returned to health; the thyroid when enlarged, returned to normal size and function, and the mental and physical complications disappeared permanently.

The thyroid may or may not enlarge when abnormal; the size has but little to do with the symptoms; in fact, the thyroid more often does not enlarge. The enlargement is due to an accumulation of the gland's own secretion as a lack of function. A case of thyroidism may choke to death without the thyroid showing any enlargement, or may go insane or die from heart or other complications. Of course a goiterous thyroid of long standing may undergo stages of degeneration or complete destruction. When you establish function, the thyroid frees itself of the accumulated secretion and diminishes in size, but as to why some cases of thyroid inefficiency show enlargement and others do not I cannot say. Inefficiency of the thyroid and other ductless glands are usually inherited.

Chemicals or iodin treatments, internal and external, may reduce the thyroid enlargement, but not establish a normal function of the gland, therefore would be expected to give only limited results, and they would not be permanent. If the thyroid secretion only contained iodin, the giving of iodin would give better results, but since the gland secretes six other elements of equal importance, we would expect iodin to both benefit and aggravate these cases; therefore the scientific treatment for thyroid affection should ensure the establishment of function. Surgical removal of the thyroid is contra-indicated, since it does not establish function of the gland.

My serum has been used in many hundreds of cases of thyroidism, in all its stages, by myself and others for the past ten years, with very encouraging results, with no contra-indications, except where the thyroid was destroyed, tubercular, cancerous, or removed surgically. The heart action, digestion, nervous choke, metabolism and mentality improve almost immediately.

A limited amount of this serum is now available to the profession.

MARK WHITE, M.D., V.M.D., Dr. PH.,
30 N. Michigan Ave., Chicago.

LICE AND MANGE INFECTION OF PIGS*

The remedial measures advocated for the treatment of mange in pigs due to *Sarcoptes scabiei suis* are thorough scrubbing with soft soap and water and the subsequent application of lard and sulphur. Several applications will be needed for badly infested animals. The same application with the addition of kerosene may be used against the eggs of the pig louse, *Haematopinus suis.*

One of the saddest instances we have been called upon to chronicle is that of the death of Dr. C. J. Skidmore, of West Mansfield, O., on February 11th, followed in three weeks by the birth of a baby girl to the widow, the only child to bless the marriage.

*Report, University of California Experiment Station.